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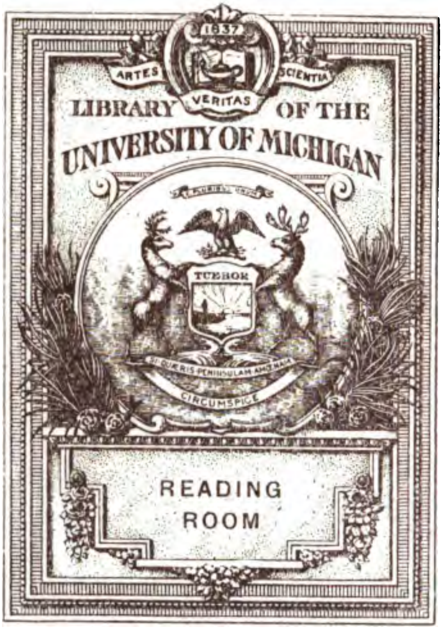

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The North American Almanac
is published every December

For Summary of Contents, see page 123

THE

North American Almanac

1922

The Aristocrat of Almanacs

CHICAGO
THE NORTH AMERICAN ALMANAC CO.
1922

Walker
6380
Reference
7 20 22

Preface

THE NORTH AMERICAN ALMANAC for 1922 is offered to the people of this continent in the fullest confidence that it will be appreciated by young and old for its interest and its accuracy. The standard of authority which it sets in the matter presented has not been equaled or even attempted before.

The articles by noted authorities touch the affairs of the home at vital points and will be of great service. The remarkable photographs and descriptions of celestial objects and the maps of the stars were prepared for this Almanac at the Yerkes Observatory of the University of Chicago.

The Almanac will be found of unique value for every school in the city or in rural regions. (A sample copy will be mailed free to any City or County Superintendent requesting it.)

Owners of the 1921 edition are advised not to discard the book at the close of the year, but to keep it for future reference. It is not our intention to reproduce from year to year the same excellent photographs of astronomical objects, and it will be necessary in future explanations to refer the reader to the pictures already published.

THE PUBLISHERS.

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1922

THE year 1922 covers the last half of the 146th year, and first half of the 147th year, of the independence of the United States of America. It is the year 6635 of the Julian Period, and the year 2675 since the foundation of Rome. We use the Gregorian Calendar, but in some countries, like Russia and Greece, the Julian Calendar is used, according to which our January 1, 1922, would be January 14, 1922. The year 5683 of the Jewish Era begins at sunset on September 22, 1922. On August 23, 1922, at sunset, is the beginning of the year 1341 of the Mohammedan Era.

In 1922, the earth is nearest to the sun (perihelion) on January 3, at 9 a. m., Central Standard Time, and farthest from the sun (aphelion) on July 2, at 3 p. m. The direction of the sun passes through the equator on March 21, 1922, at 3:49 a. m., and "spring commences." This is the vernal equinox. The direction of the sun is farthest north of the equator (summer solstice) on June 21, 1922, at 11:27 p. m., and "summer commences." The autumnal equinox occurs on September 23, 1922, at 2:10 p. m.; the winter solstice on December 22, 1922 at 8:57 a. m., Central Standard Time.

Re-class 1-30-27

1st Month—JANUARY, 1922—31 Days

First Quar., Jan. 6, 4:24 A. M.	**Last Quar., Jan. 19, 12:00 P. M.**
Full Moon, Jan. 12, 8:37 A. M.	**New Moon, Jan. 27, 5:48 P. M.**

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					P.M.								
1	Sun...	7 17	4 30	....	8 10	6 56	5 11	7 08	4 59	7 22	4 45	7 38	4 28
2	Mon..	7 17	4 31	....	9 05	6 56	5 12	7 08	5 00	7 22	4 46	7 39	4 30
3	Tue...	7 17	4 32	....	10 02	6 56	5 12	7 08	5 00	7 22	4 47	7 39	4 30
4	Wed..	7 17	4 33	....	10 59	6 57	5 13	7 09	5 01	7 22	4 48	7 39	4 32
5	Thur.	7 17	4 33	....	11 57	6 57	5 14	7 09	5 02	7 22	4 48	7 38	4 32
6	Fri....	7 17	4 34	....	A.M.	6 57	5 15	7 09	5 03	7 22	4 49	7 38	4 33
7	Sat....	7 17	4 35	....	12 56	6 57	5 15	7 09	5 04	7 22	4 50	7 38	4 34
8	Sun...	7 17	4 36	....	1 55	6 57	5 16	7 09	5 04	7 22	4 51	7 38	4 36
9	Mon...	7 17	4 37	....	2 57	6 57	5 17	7 09	5 05	7 22	4 52	7 38	4 37
10	Tue...	7 17	4 38	....	3 59	6 57	5 18	7 09	5 06	7 22	4 54	7 38	4 38
11	Wed..	7 17	4 39	P.M.	5 01	6 57	5 19	7 09	5 07	7 22	4 54	7 37	4 39
12	Thur.	7 17	4 40	4 11	5 59	6 57	5 19	7 08	5 08	7 22	4 55	7 37	4 40
13	Fri....	7 16	4 41	5 19	6 53	6 57	5 20	7 08	5 09	7 21	4 56	7 36	4 41
14	Sat....	7 16	4 42	6 31	....	6 57	5 21	7.08	5 10	7 21	4 57	7 36	4 42
15	Sun...	7 16	4 44	7 45	....	6 57	5 22	7 08	5 11	7 21	4 59	7 36	4 44
16	Mon...	7 15	4 45	8 57	....	6 57	5 23	7 08	5 12	7 20	5 00	7 35	4 45
17	Tue...	7 15	4 46	10 08	....	6 57	5 24	7 08	5 13	7 20	5 01	7 34	4 46
18	Wed..	7 14	4 48	11 17	....	6 56	5 25	7 07	5 14	7 19	5 02	7 34	4 48
19	Thur.	7 14	4 49	A.M.	....	6 56	5 25	7 07	5 15	7 19	5 03	7 33	4 49
20	Fri....	7 13	4 50	12 24	....	6 56	5 26	7 06	5 16	7 18	5 04	7 32	4 50
21	Sat....	7 12	4 51	1 28	....	6 56	5 27	7 06	5 17	7 18	5 05	7 32	4 52
22	Sun...	7 11	4 52	2 30	....	6 56	5 28	7 06	5 18	7 17	5 06	7 31	4 53
23	Mon..	7 11	4 54	3 28	....	6 55	5 29	7 05	5 19	7 17	5 08	7 30	4 54
24	Tue...	7 10	4 55	4 22	....	6 55	5 29	7 04	5 20	7 16	5 09	7 29	4 56
25	Wed..	7 09	4 56	5 10	....	6 54	5 31	7 04	5 21	7 15	5 10	7 28	4 57
26	Thur.	7 08	4 57	5 55	P.M.	6 54	5 32	7 04	5 22	7 14	5 11	7 27	4 58
27	Fri....	7 08	4 58	....	5 05	6 54	5 32	7 03	5 23	7 14	5 12	7 26	5 00
28	Sat....	7 07	5 00	....	6 01	6 53	5 33	7 02	5 24	7 13	5 14	7 25	5 01
29	Sun....	7 06	5 01	....	6 58	6 53	5 34	7 02	5 25	7 12	5 15	7 24	5 03
30	Mon..	7 05	5 02	....	7 54	6 52	5 35	7 01	5 26	7 11	5 16	7 23	5 04
31	Tue...	7 04	5 03	....	8 50	6 52	5 36	7 00	5 27	7 10	5 17	7 22	5 05

To find the time of Sunrise and Sunset in other cities than Chicago, see table of corrections on page 30.

JANUARY WEATHER

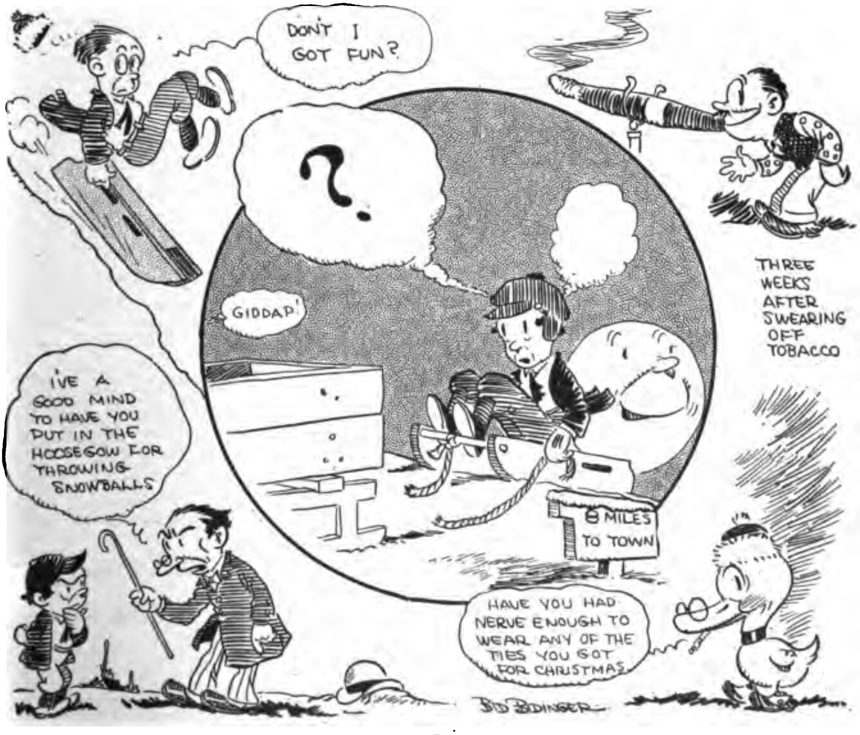
January is the mid-winter month and its last decade is usually the coldest. The lowest temperatures in the United States occur in the northern Plains States with minima sometimes falling to 40° and 50° below zero, and in Manitoba and Saskatchewan to the north as low as 50° to 60° below zero. Freezing temperature has occurred at some time in January throughout all portions of continental United States, although rarely in the extreme southern portions of California and Florida; and zero temperature has occurred over nearly the whole area from the central portions of Washington, Oregon and California on the west, almost to the middle portions of the Gulf States on the south and the Atlantic coast from Norfolk, Va., northward on the east. Blizzards occasionally prevail in the Canadian Northwest and the northern Plains States, and northers as far south as the Texas coast. The snowfall is heaviest from the Great Lakes region eastward over the St. Lawrence valley and New England, and in the western mountains, the greatest amount occurring in the Pacific coast ranges. Snow in appreciable amounts rarely falls in the extreme south and the total annual snowfall along the Gulf coast does not average one inch. Precipitation in the form of rain is heaviest in the middle Gulf region, the lower Mississippi valley and along the north Pacific coast; and the rainy season is at its height in the Pacific States.

January.

But cheerily the chickadee
Singeth to me on fence and tree;
The snow sails 'round him as he sings,
White as the down of angels' wings.
—Trowbridge.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

Jan. 1.	New Year's Day.
Jan. 6.	Epiphany.
Jan. 14.	Greek Church New Year.
Jan. 19.	Lee's Birthday.
Jan. 25.	Conversion of St. Paul.
Jan. 29.	McKinley Day.


DON'T I GOT FUN?
?
GIDDAP!
THREE WEEKS AFTER SWEARING OFF TOBACCO
I'VE A GOOD MIND TO HAVE YOU PUT IN THE HOOSEGOW FOR THROWING SNOWBALLS
8 MILES TO TOWN
HAVE YOU HAD NERVE ENOUGH TO WEAR ANY OF THE TIES YOU GOT FOR CHRISTMAS
BUD BODINGER

2d Month—FEBRUARY, 1922—28 Days

First Quar., Feb. 4, 10:52 P. M.	**Last Quar., Feb. 18, 12:18 P. M.**
Full Moon, Feb. 11, 7:18 P. M.	**New Moon, Feb. 26, 12:48 P. M.**

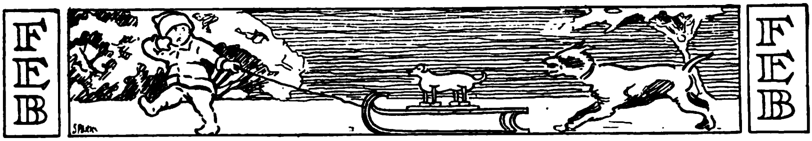
CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set.	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					P.M.								
1	Wed..	7 04	5 05	....	9 47	6 51	5 37	7 00	5 28	7 10	5 18	7 21	5 07
2	Thur.	7 03	5 07	....	10 44	6 50	5 38	6 59	5 29	7 09	5 20	7 20	5 08
3	Fri....	7 02	5 08	....	11 43	6 50	5 38	6 58	5 30	7 08	5 21	7 19	5 10
4	Sat....	7 01	5 09	....	A.M.	6 49	5 39	6 57	5 31	7 07	5 22	7 18	5 11
5	Sun...	6 59	5 10	....	12 42	6 49	5 40	6 56	5 32	7 06	5 23	7 16	5 12
6	Mon..	6 58	5 11	....	1 43	6 48	5 41	6 56	5 33	7 05	5 24	7 15	5 14
7	Tue...	6 57	5 12	....	2 42	6 47	5 42	6 55	5 34	7 04	5 26	7 14	5 15
8	Wed..	6 55	5 14	....	3 40	6 46	5 42	6 54	5 35	7 02	5 27	7 12	5 17
9	Thur.	6 54	5 15	....	4 35	6 46	5 43	6 53	5 36	7 01	5 28	7 11	5 18
10	Fri....	6 53	5 16	P.M.	5 27	6 45	5 44	6 52	5 37	7 00	5 29	7 10	5 20
11	Sat....	6 52	5 17	5 17	6 14	6 44	5 45	6 51	5 38	6 59	5 30	7 08	5 21
12	Sun...	6 51	5 19	6 31	....	6 43	5 46	6 50	5 39	6 58	5 32	7 07	5 23
13	Mon..	6 50	5 20	7 46	....	6 42	5 46	6 49	5 40	6 57	5 33	7 05	5 24
14	Tue...	6 48	5 21	8 59	....	6 42	5 47	6 48	5 41	6 55	5 34	7 04	5 25
15	Wed..	6 47	5 22	10 10	....	6 41	5 48	6 47	5 42	6 54	5 35	7 02	5 27
16	Thur.	6 46	5 23	11 17	....	6 40	5 49	6 46	5 43	6 53	5 36	7 01	5 28
17	Fri....	6 45	5 24	A.M.	....	6 39	5 50	6 45	5 44	6 52	5 37	6 59	5 30
18	Sat....	6 43	5 26	12 21	....	6 38	5 50	6 44	5 45	6 50	5 38	6 58	5 31
19	Sun...	6 42	5 28	1 18	....	6 37	5 51	6 43	5 46	6 49	5 40	6 56	5 32
20	Mon..	6 41	5 29	2 17	....	6 36	5 52	6 42	5 47	6 48	5 41	6 55	5 34
21	Tue...	6 38	5 30	3 08	....	6 35	5 53	6 40	5 48	6 46	5 42	6 53	5 35
22	Wed..	6 37	5 31	3 53	....	6 34	5 54	6 39	5 49	6 45	5 43	6 51	5 37
23	Thur.	6 36	5 32	4 34	....	6 33	5 54	6 38	5 50	6 44	5 44	6 50	5 38
24	Fri....	6 34	5 33	5 11	....	6 32	5 55	6 37	5 50	6 42	5 45	6 48	5 39
25	Sat....	6 33	5 35	5 44	P.M.	6 31	5 56	6 36	5 51	6 41	5 47	6 46	5 41
26	Sun....	6 31	5 36	6 15	5 50	6 30	5 56	6 34	5 52	6 39	5 48	6 45	5 42
27	Mon...	6 30	5 37	....	6 44	6 29	5 57	6 33	5 53	6 38	5 49	6 43	5 44
28	Tue...	6 28	5 38	....	7 40	6 28	5 58	6 32	5 54	6 36	5 50	6 41	5 45

To find the time of Sunrise and Sunset in other cities than Chicago, see table of corrections on page 30.

FEBRUARY WEATHER

The first decade of February averages nearly as cold as the last decade in January, and the month, as a whole, averages about 1° to 3° higher than January. After the 10th of the month, cold waves are likely to be of short duration and not so intense as those of mid-winter; but the severe cold wave of February, 1899, occurred at the beginning of the second decade and it was then that the line of zero temperature was carried to the central Gulf coast, a minimum of 1° below zero being registered at Mobile, Ala., 6° above zero at New Orleans, La., and 10° above zero at Jacksonville, Fla. Throughout the Gulf States the minimum temperatures in that cold wave were from 3° to 9° lower than ever before noted. Freezing temperature as a rule does not occur after the second decade as far south as the Gulf coast. The changes in temperature are likely to be sudden in February as well as in January, with the exception of the Pacific coast region, where equable weather prevails during practically all seasons. Blizzards, northers and snow and rain prevail much the same as in January in the various districts. Following the mid-winter snow and cold, the snow on the ground usually reaches its greatest depth and greatest area in the first ten days of February. Thunderstorms rarely occur in mid-winter, except in the South, where there is a considerable increase in frequency toward the end of February. Tornadoes are also noted there occasionally at this time.

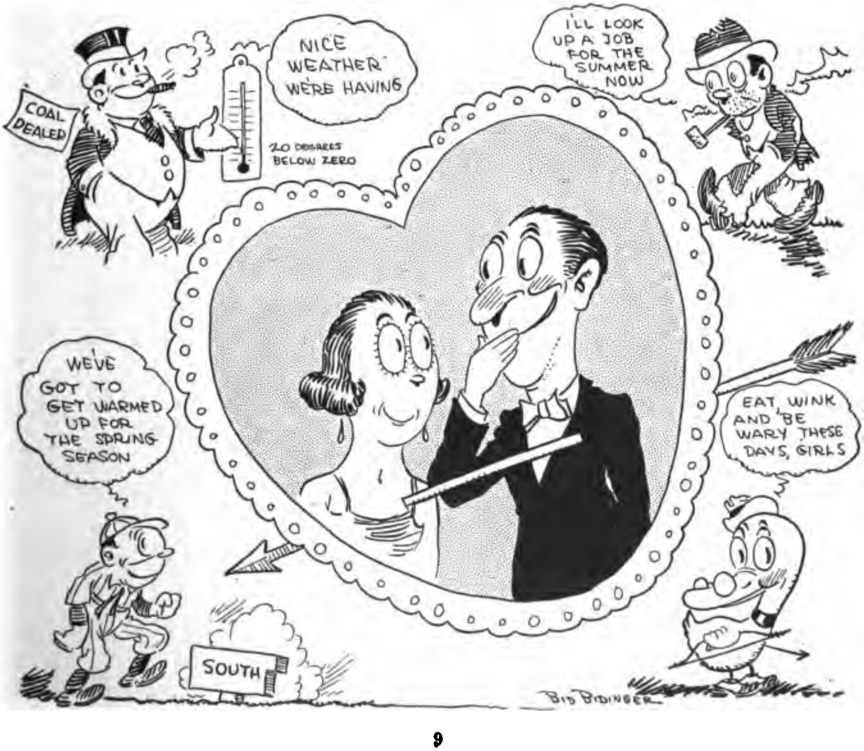


February.

So when the night falls, and dogs do howl,
Sing, Ho! for the reign of the horned owl!
We know not alway
Who are kings by day,
But the king of the night is the bold brown owl.
—Barry Cornwall.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

Feb. 2. Purification B. V. M.
Feb. 2. Candlemas—"Ground Hog" Day.
Feb. 12. Septuagesima.
Feb. 12. Lincoln's Birthday.
Feb. 14. St. Valentine.
Feb. 22. Washington's Birthday.
Feb. 24. St. Mathias.
Feb. 26. Quinquagesima (Shrove Sunday).
Feb. 28. Mardi Gras.


COAL DEALER
NICE WEATHER WE'RE HAVING
20 DEGREES BELOW ZERO
I'LL LOOK UP A JOB FOR THE SUMMER NOW
WE'VE GOT TO GET WARMED UP FOR THE SPRING SEASON
EAT, WINK AND BE WARY THESE DAYS, GIRLS
SOUTH
BID BIDINGER

3d Month—MARCH, 1922—31 Days

First Quar., March 6, 1:22 P. M. **Last Quar., March 20, 2:43 A. M.**
Full Moon, March 13, 5:14 A. M. **New Moon, March 28, 7:03 A. M.**

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					P.M.								
1	Wed..	6 27	5 39	....	8 38	6 27	5 59	6 31	5 55	6 35	5 51	6 40	5 46
2	Thur.	6 25	5 40	....	9 36	6 26	5 59	6 29	5 56	6 33	5 52	6 38	5 48
3	Fri....	6 24	5 42	....	10 35	6 25	6 00	6 28	5 57	6 32	5 53	6 36	5 49
4	Sat....	6 22	5 43	....	11 32	6 24	6 01	6 27	5 58	6 30	5 54	6 34	5 50
5	Sun....	6 21	5 44	....	A.M.	6 23	6 01	6 26	5 58	6 29	5 55	6 33	5 52
6	Mon..	6 19	5 45	....	12 31	6 22	6 02	6 24	5 59	6 27	5 56	6 31	5 53
7	Tue...	6 17	5 47	....	1 28	6 20	6 03	6 23	6 00	6 26	5 58	6 29	5 54
8	Wed..	6 15	5 47	....	2 22	6 19	6 03	6 22	6 01	6 24	5 58	6 27	5 56
9	Thur.	6 14	5 49	....	3 14	6 18	6 04	6 20	6 02	6 23	6 00	6 25	5 57
10	Fri....	6 12	5 50	....	4 02	6 17	6 05	6 19	6 03	6 21	6 01	6 24	5 58
11	Sat....	6 11	5 51	....	4 46	6 16	6 05	6 17	6 04	6 20	6 02	6 22	6 00
12	Sun...	6 09	5 52	P.M.	5 26	6 15	6 06	6 16	6 04	6 18	6 03	6 20	6 01
13	Mon...	6 07	5 53	6 31	6 05	6 14	6 06	6 15	6 05	6 16	6 04	6 18	6 02
14	Tue...	6 06	5 54	7 45	....	6 12	6 07	6 13	6 06	6 15	6 05	6 16	6 04
15	Wed..	6 04	5 56	8 56	....	6 11	6 08	6 12	6 07	6 13	6 06	6 14	6 05
16	Thur	6 02	5 57	10 05	....	6 10	6 08	6 11	6 08	6 12	6 07	6 12	6 06
17	Fri....	6 00	5 58	11 10	....	6 09	6 09	6 09	6 09	6 10	6 08	6 11	6 08
18	Sat....	5 58	5 59	A.M.	....	6 08	6 10	6 08	6 09	6 08	6 09	6 09	6 09
19	Sun....	5 57	6 00	12 09	....	6 06	6 10	6 06	6 10	6 07	6 10	6 07	6 10
20	Mon..	5 55	6 01	1 03	....	6 05	6 11	6 05	6 11	6 05	6 11	6 05	6 11
21	Tue...	5 54	6 02	1 50	....	6 04	6 12	6 04	6 12	6 04	6 12	6 03	6 13
22	Wed..	5 52	6 03	2 33	....	6 03	6 12	6 02	6 13	6 02	6 13	6 01	6 14
23	Thur.	5 50	6 04	3 11	....	6 01	6 13	6 01	6 13	6 00	6 14	5 59	6 15
24	Fri....	5 49	6 05	3 45	....	6 00	6 13	6 00	6 14	5 59	6 15	5 58	6 16
25	Sat....	5 47	6 06	4 17	....	5 59	6 14	5 58	6 15	5 57	6 16	5 56	6 18
26	Sun...	5 45	6 07	4 46	....	5 58	6 15	5 57	6 16	5 55	6 17	5 54	6 19
27	Mon..	5 44	6 09	5 16	P.M.	5 56	6 16	5 55	6 17	5 54	6 18	5 52	6 20
28	Tue...	5 42	6 10	....	6 32	5 55	6 16	5 54	6 17	5 52	6 19	5 50	6 22
29	Wed..	5 40	6 11	....	7 30	5 54	6 16	5 52	6 18	5 50	6 20	5 48	6 23
30	Thur.	5 38	6 12	....	8 29	5 53	6 17	5 51	6 19	5 49	6 21	5 46	6 24
31	Fri....	5 36	6 13	....	9 27	5 52	6 18	5 50	6 20	5 47	6 22	5 44	6 25

To find the time of Sunrise and Sunset for other cities than Chicago, see table of corrections on page 30.

MARCH WEATHER

The temperature continues to rise during the month of March, but there are occasionally sudden changes to colder weather for a day or two, especially in northern and central districts. Zero weather seldom occurs, except in the more northerly sections, and freezing temperature on the average does not reach the Gulf coast, but at some time it has fallen to freezing as late as March 20 on the middle Gulf coast. March, 1910, and March, 1907, were both unusually warm, 100° being registered in the latter month in Oklahoma, while in March, 1910, all records were broken for persistent absence of precipitation. Blizzards and northers occur occasionally in March, and storms move across the country with great rapidity, attended by strong winds and gales. March is the windiest month of the year. The famous March blizzard of 1888 occurred on the 10-13th in New York State and New England. The thunderstorm season becomes general in the South and it begins in the Middle States, with now and then a tornado. The Louisville tornado occurred on March 27, 1890, and the Omaha tornado on March 23, 1913. March is the month of greatest tornado frequency in the east Gulf and South Atlantic States, although not much unlike February in that respect. Precipitation generally is greater in March than in the winter months in nearly all sections from the Rockies eastward; and while the rainy season continues in the Pacific coast region, the amount decreases toward the end of the month.

March.

The pussy-willow and the hazel know,
  The bluebird and the robin, what rings true.
I trust to such and let the whiners go.
  Bravo! bluff March; I swing my hat to you.
—John Vance Cheney.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

March 1.	Ash Wednesday.
March 1.	St. David's Day.
March 2.	Texas Independence Day.
March 17.	St. Patrick's Day.
March 25.	Annunciation (Lady Day).

Ember Days—March 8, 10 and 11.

TRAFFIC COP
BUSINESS WILL SOON BEGIN TO PICK UP
I MIGHT AS WELL PUT THE SLED AWAY NOW, SHUCKS!
Beware
KING WINTER
SPRING
WHO INVENTED SPRING FEVER?
NOW COME THE RAG-PICKERS
'BUD BIDINGER—O—

4th Month—APRIL, 1922—30 Days

First Quar., April 4, 11:46 P. M. **Last Quar., April 18, 6:54 P. M.**
Full Moon, April 11, 2:44 P. M. **New Moon, April 26, 11:04 P. M.**

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					P.M.								
1	Sat....	5 35	6 14	....	10 25	5 50	6 18	5 48	6 20	5 46	6 23	5 42	6 26
2	Sun...	5 33	6 15	....	11 12	5 49	6 19	5 47	6 21	5 44	6 24	5 41	6 28
3	Mon...	5 31	6 16	....	A.M.	5 48	6 19	5 45	6 22	5 42	6 25	5 39	6 29
4	Tue...	5 30	6 17	....	12 16	5 47	6 20	5 44	6 23	5 41	6 26	5 37	6 30
5	Wed..	5 28	6 18	....	1 07	5 46	6 21	5 43	6 24	5 39	6 27	5 35	6 32
6	Thur.	5 27	6 19	....	1 55	5 44	6 21	5 41	6 24	5 38	6 28	5 33	6 33
7	Fri....	5 25	6 21	....	2 38	5 44	6 22	5 40	6 25	5 36	6 29	5 31	6 34
8	Sat....	5 23	6 22	....	3 18	5 42	6 22	5 39	6 26	5 34	6 30	5 29	6 35
9	Sun...	5 22	6 23	....	3 57	5 41	6 23	5 37	6 27	5 33	6 31	5 28	6 37
10	Mon..	5 20	6 24	P.M.	4 34	5 40	6 24	5 36	6 28	5 31	6 32	5 26	6 38
11	Tue...	5 19	6 25	6 31	5 12	5 39	6 24	5 34	6 28	5 30	6 33	5 24	6 39
12	Wed..	5 17	6 26	7 42	....	5 38	6 25	5 33	6 29	5 28	6 34	5 22	6 40
13	Thur.	5 15	6 27	8 50	....	5 36	6 25	5 32	6 30	5 27	6 35	5 20	6 42
14	Fri....	5 13	6 28	9 54	....	5 35	6 26	5 30	6 31	5 25	6 36	5 19	6 43
15	Sat....	5 12	6 30	10 53	....	5 34	6 27	5 29	6 32	5 24	6 38	5 17	6 44
16	Sun...	5 10	6 30	11 44	....	5 33	6 27	5 28	6 32	5 22	6 38	5 15	6 46
17	Mon..	5 09	6 32	A.M.	....	5 32	6 28	5 27	6 33	5 21	6 40	5 13	6 47
18	Tue...	5 07	6 33	12 35	....	5 31	6 28	5 25	6 34	5 19	6 40	5 12	6 48
19	Wed..	5 06	6 35	1 10	....	5 30	6 29	5 24	6 35	5 18	6 42	5 10	6 49
20	Thur.	5 04	6 35	1 46	....	5 29	6 30	6 23	6 36	5 16	6 42	5 08	6 50
21	Fri....	5 03	6 37	2 18	....	5 28	6 30	6 22	6 36	5 15	6 44	5 07	6 52
22	Sat....	5 01	6 37	2 49	....	5 27	6 31	5 20	6 37	5 13	6 44	5 05	6 53
23	Sun...	4 59	6 39	3 18	....	5 26	6 32	5 19	6 38	5 12	6 46	5 03	6 54
24	Mon..	4 57	6 39	3 46	....	5 25	6 32	5 18	6 39	5 10	6 46	5 02	6 56
25	Tue...	4 56	6 41	4 15	....	5 24	6 33	5 17	6 40	5 09	6 48	5 00	6 57
26	Wed..	4 55	6 42	4 45	P.M.	5 23	6 34	5 16	6 40	5 08	6 49	4 58	6 58
27	Thur.	4 53	6 43	....	7 20	5 22	6 34	5 14	6 41	5 06	6 50	4 57	6 59
28	Fri....	4 52	6 44	....	8 20	5 21	6 35	5 13	6 42	5 05	6 51	4 55	7 01
29	Sat....	4 51	6 45	....	9 17	5 20	6 35	5 12	6 43	5 04	6 52	4 54	7 02
30	Sun....	4 49	6 46	....	10 13	5 19	6 36	5 11	6 44	5 02	6 53	4 52	7 03

To find the time of Sunrise and Sunset for other cities than Chicago, see table of corrections on page 30.

APRIL WEATHER

The temperature on the average increases in April, and to a greater degree than in March, but there are occasional cold periods, especially in the more northerly sections east of the Rockies. In April, 1907, following a warm March, there was a complete reversal in temperature from the Great Lakes region and central valleys southward to the Gulf, and light frost formed in northern Florida as late as the 14-15th. As a rule, freezing temperatures are not experienced after April 15 south of a line running through central Virginia, western North Carolina and the southern portions of Kentucky, Missouri and Kansas. Blizzards and northers are of rare occurrence in April, but occasionally some storms bring severe conditions. In most districts the heaviest snows fall in mid-winter, but the biggest storms of this character in Colorado and Wyoming are likely to occur in March and April. At Denver, Col., on the 22d of April, 1885, 23 inches of snow fell. The storm movement is much less frequent in April than in March, with a consequent diminution in wind force. The rainfall in the Pacific coast region continues to decrease in amount; but there is an increase in the sections directly to the east across the Rocky Mountains, where the rains are less protracted and often in the form of local showers, sometimes attended by thunderstorms, of which there is a considerable increase, some being noted in the extreme north. There is a slight increase in the number of tornadoes in the Middle States.

April.

The golden-wings and bluebirds
  Call to their heavenly choirs.
The pines are blued and drifted
  With smoke of brushwood fires.

—Bliss Carman.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

April 2.	Passion Sunday.
April 9.	Palm Sunday.
April 13.	First Day of Passover.
April 13.	Jefferson's Birthday.
April 14.	Good Friday.
April 16.	Easter.
April 23.	Low Sunday.
April 23.	St. George.
April 25.	St. Mark.
April 26.	Southern Memorial Day.

GREET ME!
BASEBALL SEASON
GUESS I HAD BETTER START HUNTING FOR MY OLD STRAW HAT
I'M WISE!
AINT YOU A BIT SCARED WILLIE?
NAW!
THIS IS THE MONTH OF THE PERPETUAL BATH

5th Month—MAY, 1922—31 Days

First Quar., May 4, 6:56 A. M. **Last Quar., May 18, 12:17 P. M.**
Full Moon, May 11, 12:06 A. M. **New Moon, May 26, 12:04 P. M.**

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 80)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					P.M.								
1	Mon..	4 48	6 47	....	11 05	5 18	6 37	5 10	6 45	5 01	6 54	4 51	7 04
2	Tue...	4 47	6 48	....	11 53	5 17	6 37	5 09	6 45	5 00	6 55	4 49	7 06
3	Wed..	4 46	6 49	....	A.M.	5 16	6 38	5 08	6 46	4 59	6 56	4 48	7 07
4	Thur.	4 44	6 50	....	12 37	5 15	6 39	5 07	6 47	4 57	6 57	4 46	7 08
5	Fri....	4 42	6 51	....	1 17	5 14	6 39	5 06	6 48	4 56	6 58	4 45	7 09
6	Sat....	4 41	6 52	....	1 55	5 14	6 40	5 05	6 49	4 55	6 59	4 43	7 10
7	Sun...	4 40	6 53	....	2 31	5 13	6 41	5 04	6 50	4 54	7 00	4 42	7 12
8	Mon...	4 39	6 54	....	3 07	5 12	6 41	5 03	6 50	4 53	7 01	4 41	7 13
9	Tue...	4 38	6 55	P.M.	3 44	5 11	6 42	5 02	6 51	4 52	7 02	4 39	7 14
10	Wed..	4 37	6 56	6 29	4 24	5 10	6 43	5 01	6 52	4 51	7 03	4 38	7 15
11	Thur.	4 36	6 57	7 36	....	5 10	6 43	5 00	6 53	4 50	7 04	4 37	7 16
12	Fri....	4 34	6 58	8 37	....	5 09	6 44	4 59	6 54	4 48	7 04	4 36	7 18
13	Sat....	4 37	7 00	9 33	....	5 08	6 44	4 58	6 54	4 48	7 06	4 34	7 19
14	Sun....	4 32	7 00	10 22	....	5 08	6 45	4 58	6 55	4 46	7 06	4 33	7 20
15	Mon..	4 32	7 02	11 06	....	5 07	6 46	4 57	6 56	4 46	7 08	4 32	7 21
16	Tue...	4 30	7 02	11 44	....	5 06	6 46	4 56	6 57	4 44	7 08	4 31	7 22
17	Wed..	4 30	7 03	A.M.	....	5 06	6 47	4 56	6 57	4 44	7 09	4 30	7 24
18	Thur	4 29	7 04	12 19	....	5 05	6 48	4 55	6 58	4 43	7 10	4 29	7 25
19	Fri....	4 28	7 06	12 50	....	5 05	6 48	4 54	6 59	4 42	7 11	4 28	7 26
20	Sat....	4 27	7 07	1 19	....	5 04	6 49	4 53	7 00	4 41	7 12	4 26	7 27
21	Sun...	4 26	7 08	1 48	....	5 04	6 50	4 53	7 00	4 40	7 13	4 26	7 28
22	Mon..	4 25	7 09	2 17	....	5 03	6 50	4 52	7 01	4 40	7 14	4 25	7 29
23	Tue...	4 24	7 10	2 47	....	5 02	6 51	4 52	7 02	4 39	7 15	4 24	7 30
24	Wed..	4 23	7 11	3 18	....	5 02	6 51	4 51	7 03	4 38	7 16	4 23	7 31
25	Thur.	4 22	7 11	3 55	....	5 02	6 52	4 50	7 03	4 37	7 16	4 22	7 32
26	Fri....	4 22	7 12	....	P.M.	5 01	6 52	4 50	7 04	4 37	7 17	4 21	7 33
27	Sat....	4 21	7 13	....	8 07	5 01	6 53	4 49	7 05	4 36	7 18	4 20	7 34
28	Sun....	4 21	7 14	....	9 02	5 00	6 54	4 49	7 05	4 36	7 19	4 20	7 35
29	Mon..	4 20	7 15	....	9 52	5 00	6 54	4 48	7 06	4 35	7 20	4 19	7 36
30	Tue...	4 19	7 15	....	10 38	5 00	6 55	4 48	7 07	4 34	7 20	4 18	7 37
31	Wed..	4 19	7 16	....	11 19	5 00	6 55	4 48	7 07	4 34	7 21	4 17	7 38

To find the time of Sunrise and Sunset for other cities than Chicago, see table of corrections on page 30.

MAY WEATHER

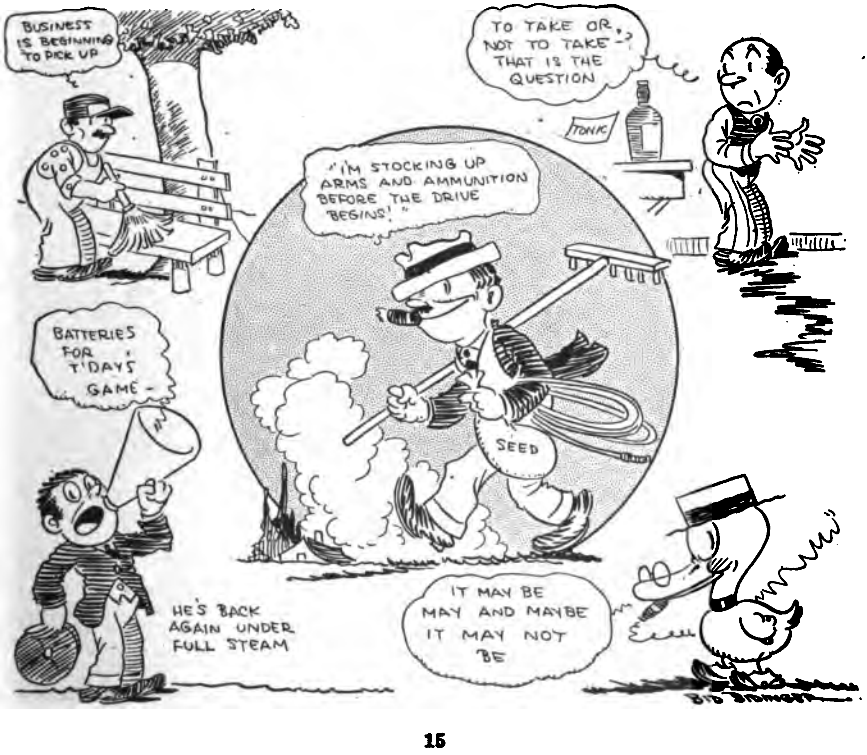
The temperature on the average continues to increase with the advance of the season, and especially in central and northern districts. Rarely the average temperature is lower than the previous April. The only instance of the kind occurred in 1915, when the May temperature averaged from 1° to 2° lower than that of April over the north-central portion of the United States. Freezing temperature has never been experienced in May, in the portions of the country east of the Mississippi River and south of a line running from Washington, D. C., to St. Louis, Mo., except in the mountain sections. As a rule, killing frost does not occur after the 10th, except in the more northerly sections. Hot waves of considerable intensity seldom occur in May until the end of the month, but instances of extreme heat earlier in the month are on record in the Middle States. In 1911 was the warmest May ever experienced, when maxima exceeding 100° were registered in the last week at several points immediately north of the Ohio River, and as early as the 9th in portions of Kansas. The rainfall continues to increase in amount from the Rockies eastward to the Appalachians. There is a marked decrease in rainfall in the Pacific region as the dry season approaches. In May is an increase in thunderstorm and tornado frequency in the Northern and Central States. May 27, 1896, is the date of the St. Louis tornado, the most destructive storm of that character ever noted in the United States.

May.

How falls it, oriole, thou hast come to fly
In tropic splendor through our Northern sky?
At some glad moment was it Nature's choice
To dower a scrap of sunset with a voice?
—Fawcett.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

May 1.	Philip and James.
May 10.	Memorial Day (N. and S. C.).
May 13.	Jefferson's Birthday.
May 14.	Mothers' Day.
May 21.	Rogation Sunday.
May 25.	Ascension.
May 30.	Memorial Day.


BUSINESS IS BEGINNING TO PICK UP
TO TAKE OR NOT TO TAKE—? THAT IS THE QUESTION
TONIC
"I'M STOCKING UP ARMS AND AMMUNITION BEFORE THE DRIVE BEGINS!"
BATTERIES FOR T'DAYS GAME—
SEED
HE'S BACK AGAIN UNDER FULL STEAM
IT MAY BE MAY AND MAYBE IT MAY NOT BE

6th Month—JUNE, 1922—30 Days

First Quar., June 2, 12:10 P. M. **Last Quar., June 17, 6:03 A. M.**
Full Moon, June 9, 9:58 A. M. **New Moon, June 24, 10:20 P. M.**

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					P.M.								
1	Thur.	4 18	7 17	....	11 57	4 59	6 56	4 47	7 08	4 33	7 22	4 17	7 38
2	Fri....	4 18	7 18	....	A.M.	4 59	6 56	4 47	7 08	4 33	7 23	4 16	7 39
3	Sat....	4 18	7 18	....	12 33	4 59	6 57	4 47	7 09	4 33	7 23	4 16	7 40
4	Sun...	4 17	7 19	....	1 08	4 59	6 58	4 46	7 10	4 32	7 24	4 15	7 41
5	Mon..	4 17	7 20	....	1 43	4 58	6 58	4 46	7 10	4 32	7 25	4 15	7 42
6	Tue...	4 17	7 20	....	2 21	4 58	6 58	4 46	7 11	4 32	7 25	4 14	7 42
7	Wed..	4 16	7 21	....	3 00	4 58	6 59	4 46	7 11	4 31	7 26	4 14	7 43
8	Thur.	4 16	7 22	P.M.	3 44	4 58	6 59	4 46	7 12	4 31	7 27	4 14	7 44
9	Fri....	4 16	7 22	7 21	....	4 58	7 00	4 46	7 12	4 31	7 27	4 13	7 45
10	Sat....	4 16	7 23	8 13	....	4 58	7 00	4 45	7 13	4 31	7 28	4 13	7 45
11	Sun...	4 15	7 23	9 01	....	4 58	7 01	4 45	7 13	4 30	7 28	4 13	7 46
12	Mon..	4 15	7 24	9 42	....	4 58	7 01	4 45	7 14	4 30	7 29	4 13	7 46
13	Tue...	4 14	7 24	10 18	....	4 58	7 01	4 45	7 14	4 30	7 29	4 13	7 47
14	Wed..	4 14	7 25	10 50	....	4 58	7 02	4 45	7 15	4 30	7 30	4 13	7 47
15	Thur.	4 14	7 25	11 21	....	4 58	7 02	4 45	7 15	4 30	7 30	4 12	7 48
16	Fri....	4 14	7 25	11 50	....	4 58	7 02	4 45	7 16	4 30	7 30	4 12	7 48
17	Sat....	4 14	7 26	A.M.	....	4 58	7 03	4 45	7 16	4 30	7 31	4 12	7 49
18	Sun...	4 14	7 26	12 18	....	4 59	7 03	4.45	7 16	4 30	7 31	4 12	7 49
19	Mon...	4 14	7 27	12 47	....	4 59	7 03	4 46	7 16	4 30	7 32	4 13	7 50
20	Tue...	4 15	7 27	1 18	....	4 59	7 04	4 46	7 17	4 31	7 32	4 13	7 50
21	Wed..	4 15	7 27	1 52	....	4 59	7 04	4 46	7 17	4 31	7 32	4 13	7 50
22	Thur.	4 15	7 28	2 30	....	4 59	7 04	4 46	7 17	4 31	7 32	4 13	7 50
23	Fri....	4 15	7 28	3 13	....	5 00	7 04	4 46	7 17	4 31	7 32	4 13	7 50
24	Sat....	4 16	7 28	4 04	P.M.	5 00	7 04	4 47	7 17	4 32	7 32	4 14	7 50
25	Sun...	4 16	7 29	....	7 46	5 00	7 05	4 47	7 18	4 32	7 33	4 14	7 51
26	Mon...	4 16	7 29	....	8 35	5 00	7 05	4 47	7 18	4 32	7 33	4 14	7 51
27	Tue...	4 17	7 29	....	9 19	5 00	7 05	4 48	7 18	4 33	7 33	4 15	7 51
28	Wed..	4 17	7 29	....	9 59	5 01	7 05	4 48	7 18	4 33	7 33	4 15	7 51
29	Thur.	4 17	7 29	....	10 35	5 01	7 05	4 48	7 18	4 33	7 33	4 15	7 50
30	Fri....	4 18	7 29	....	11 11	5 02	7 05	4 49	7 18	4 34	7 33	4 16	7 50

To find the time of Sunrise and Sunset for other cities than Chicago, see table of corrections on page 30.

JUNE WEATHER

The temperature continues to increase on the average in June, the monthly mean in the Northern States east of the Rockies usually being 10° higher than May and 20° higher than April. Rather high temperatures are customary for limited periods, but only occasionally does the temperature reach 100° in June, except in the far Southwest. Frosts seldom occur in this month, except in mountain sections, bog lands, and the extreme northern portions of the Great Plains and Great Lakes region. Freezing temperature has occurred in upper Michigan and the northern portions of Wisconsin and Minnesota as late as June 20. The dry season in the Pacific districts has usually begun by June 1, and thereafter until October there is very little rainfall, except in the more northerly portion. There is an increase in rainfall in the Gulf States, especially over the Florida peninsula, where torrential showers are frequent. The precipitation of June following that in the spring months is most important and vitally essential for the growth of crops. On this account June is the month of heaviest foliage and bloom. The wind movement on the average is considerably less than in May and no strong winds are likely, except with thundersqualls. The thunderstorm frequency reaches its maximum in northern and central sections in June and nearly all rains fall with such disturbances, more or less brief in duration. June is the month of maximum tornado frequency in the Middle States. There is an increase in the amount of sunshine.

June.

When first earth's wrinkled face
  Saw the white moon
Gleam on unfinished work,
  There was no June,—
But as the thoughts of God
  Showed perfect spheres,
We think He called up June
  To gem the years!

—Irene Elder Morton.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

June 2.	Hebrew Pentecost (Shebuoth).	June 11.	St. Barnabas.
June 3.	Jefferson Davis' Birthday.	June 14.	Flag Day.
June 4.	Pentecost (Whitsunday).	June 15.	Corpus Christi.
June 11.	Trinity Sunday.	June 24.	Nativity of John the Baptist.
		June 29.	Peter and Paul.

Ember Days—June 7, 9 and 10.

WHEE-E-E NOTHIN' TO DO BUT FISH AND SWIM FOR THREE MONTHS
SCHOOL CLOSES
THIS DONT MEAN ANYTHING WHEN IT COMES TO GETTING A JOB
DIPLOMA
LIFE IS JUST ONE RIPPLE AFTER ANOTHER
MARRIAGE BUREAU
THE ONLY MUSIC THE GIRLS APPRECIATE NOWADAYS COMES FROM AN AUTOMOBILE HORN
AHA-A-A MOONSHINE!

7th Month—JULY, 1922—31 Days

First Quar., July 1, 4:52 P. M.
Full Moon, July 8, 9:07 P. M.
Last Quar., July 16, 11:11 P. M.
New Moon, July 24, 6:47 A. M.
First Quar., July 30, 10:22 P. M.

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
1	Sat....	4 18	7 28	....	P.M. 11 46	5 02	7 05	4 49	7 18	4 34	7 33	4 16	7 50
2	Sun...	4 19	7 28	....	A.M.	5 02	7 05	4 49	7 18	4 35	7 33	4 17	7 50
3	Mon...	4 19	7 27		12 22	5 03	7 05	4 50	7 18	4 35	7 32	4 18	7 50
4	Tue...	4 20	7 27		12 59	5 03	7 05	4 50	7 18	4 36	7 32	4 18	7 50
5	Wed..	4 20	7 27		1 41	5 03	7 05	4 51	7 18	4 36	7 32	4 19	7 49
6	Thur.	4 21	7 27		2 26	5 04	7 05	4 51	7 17	4 37	7 32	4 19	7 49
7	Fri.....	4 21	7 27		3 16	5 04	7 05	4 52	7 17	4 37	7 32	4 20	7 49
8	Sat....	4 22	7 26	P.M.	4 09	5 05	7 04	4 52	7 17	4 38	7 31	4 21	7 48
9	Sun....	4 23	7 26	7 38	....	5 05	7 04	4 53	7 17	4 39	7 31	4 22	7 48
10	Mon...	4 23	7 25	8 16	....	5 06	7 04	4 54	7 16	4 39	7 30	4 22	7 47
11	Tue...	4 24	7 25	8 51	....	5 06	7 04	4 54	7 16	4 40	7 30	4 23	7 47
12	Wed..	4 25	7 25	9 23	....	5 07	7 04	4 55	7 16	4 41	7 30	4 24	7 46
13	Thur.	4 25	7 24	9 52	....	5 07	7 03	4 55	7 15	4 41	7 29	4 25	7 46
14	Fri.....	4 26	7 24	10 20	....	5 08	7 03	4 56	7 15	4 42	7 29	4 26	7 45
15	Sat....	4 27	7 23	10 51	....	5 08	7 03	4 56	7 15	4 43	7 28	4 26	7 44
16	Sun...	4 28	7 23	11 18	....	5 09	7 02	4 57	7 14	4 44	7 28	4 27	7 44
17	Mon..	4 29	7 22	11 51	....	5 10	7 02	4 58	7 14	4 44	7 27	4 28	7 43
18	Tue...	4 30	7 21	A.M.	....	5 10	7 02	4 58	7 13	4 45	7 26	4 29	7 42
19	Wed.	4 31	7 21	12 26	....	5 11	7 01	4 59	7 13	4 46	7 26	4 30	7 41
20	Thur.	4 32	7 20	1 05	....	5 11	7 01	5 00	7 12	4 47	7 25	4 31	7 40
21	Fri....	4 33	7 19	1 52	....	5 12	7 00	5 00	7 12	4 48	7 24	4 32	7 40
22	Sat.....	4 33	7 19	2 46	....	5 12	7 00	5 01	7 11	4 48	7 24	4 33	7 39
23	Sun....	4 34	7 18	3 45	....	5 13	6 59	5 02	7 10	4 49	7 23	4 34	7 38
24	Mon...	4 35	7 17	....	P.M.	5 13	6 59	5 02	7 10	4 50	7 22	4 35	7 37
25	Tue...	4 36	7 16	....	7 55	5 14	6 58	5 03	7 09	4 51	7 21	4 36	7 36
26	Wed..	4 37	7 15	....	8 36	5 15	6 58	5 04	7 08	4 52	7 20	4 37	7 35
27	Thur.	4 38	7 14	....	9 12	5 15	6 57	5 05	7 08	4 53	7 19	4 38	7 34
28	Fri.....	4 39	7 13	....	9 48	5 16	6 56	5 06	7 07	4 54	7 18	4 40	7 32
29	Sat.....	4 40	7 12	....	10 25	5 16	6 56	5 06	7 06	4 54	7 18	4 41	7 31
30	Sun....	4 41	7 11	....	11 02	5 17	6 55	5 07	7 05	4 55	7 17	4 42	7 30
31	Mon...	4 42	7 10	....	11 41	5 18	6 54	5 08	7 04	5 56	7 16	4 43	7 29

To find the time of Sunrise and Sunset for other cities than Chicago, see table of corrections on page 30.

JULY WEATHER

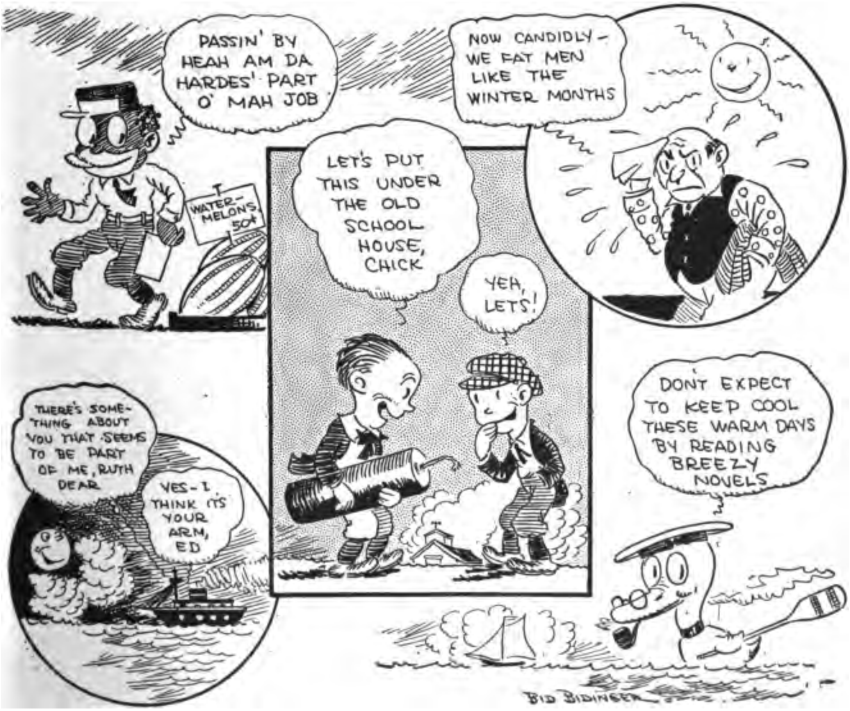
July, the midsummer month, has the highest average temperature for the whole year, except along the Pacific coast and in portions of the Gulf region. Except in the higher levels or in sections close to large bodies of water, it is a month of protracted warm waves with only occasional changes to cooler weather. The greatest heat occurs in the far Southwest. The highest officially recorded temperature is 134°, registered on July 10, 1913, at Greenlands Ranch, in Death Valley, Cal. The longest and most intense warm wave in the Middle States occurred in 1901, lasting from the latter part of June until the end of July. In central Missouri the thermometer registered a maximum of over 100° for 34 consecutive days, with an absolute maximum of 111° on the 12th. During the warm waves in the Plains States and the central valleys, the temperature occasionally rises to 100° and higher; but in the Gulf States the maxima do not run so high, although the means there are higher than in other sections because of the relatively warm nights. The dry season is in full sway in the Pacific States. In the States east of the Rockies the distribution of rainfall is much the same as in June. In the far Southwest under favorable conditions thundershowers bring the rains of the year. The wind movement is even less than in June.

July.

Joy on the branch and joy in the sky,
And naught between but the breezes high,
And naught so glad on the breezes heard
As the gay, gay note of the Indigo bird.
—Ethelwyn Wetherald.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

July 4.	Independence Day.
July 15.	St. Swithin's Day.
July 22.	Mary Magdalen.
July 25.	St. James.


PASSIN' BY HEAH AM DA HARDES' PART O' MAH JOB
WATER-MELONS 50¢
NOW CANDIDLY - WE FAT MEN LIKE THE WINTER MONTHS
LET'S PUT THIS UNDER THE OLD SCHOOL HOUSE, CHICK
YEA, LETS!
THERE'S SOME-THING ABOUT YOU THAT SEEMS TO BE PART OF ME, RUTH DEAR
YES - I THINK ITS YOUR ARM, ED
DONT EXPECT TO KEEP COOL THESE WARM DAYS BY READING BREEZY NOVELS
BID BIDINGER

8th Month—AUGUST, 1922—31 Days

Full Moon, Aug. 7, 10:19 A. M. **New Moon, Aug. 22, 2:34 P. M.**
Last Quar., Aug. 15, 2:46 P. M. **First Quar., Aug. 29, 5:55 A. M.**

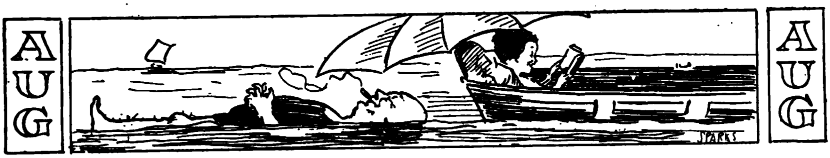
CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
1	Tue....	4 43	7 08	....	A.M.	5 18	6 54	5 09	7 04	4 57	7 14	4 44	7 28
2	Wed..	4 44	7 08	....	12 26	5 19	6 53	5 09	7 03	4 58	7 14	4 45	7 26
3	Thur.	4 45	7 06	....	1 13	5 20	6 52	5 10	7 02	4 59	7 12	4 46	7 25
4	Fri....	4 46	7 05	....	2 04	5 20	6 52	5 11	7 01	5 00	7 11	4 47	7 24
5	Sat....	4 47	7 04	....	2 58	5 21	6 51	5 11	7 00	5 01	7 10	4 49	7 22
6	Sun....	4 48	7 03	P.M.	3 53	5 21	6 50	5 12	6 59	5 02	7 09	4 50	7 21
7	Mon..	4 49	7 02	6 52	4 51	5 22	6 49	5 13	6 58	5 03	7 08	4 51	7 20
8	Tue...	4 50	7 01	7 24	....	5 22	6 48	5 14	6 57	5 04	7 07	4 52	7 18
9	Wed..	4 52	6 59	7 54	....	5 23	6 47	5 14	6 56	5 05	7 06	4 53	7 17
10	Thur.	4 53	6 57	8 22	....	5 24	6 46	5 15	6 55	5 06	7 04	4 54	7 15
11	Fri....	4 54	6 56	8 52	....	5 24	6 46	5 16	6 54	5 07	7 03	4 56	7 14
12	Sat....	4 55	6 55	9 21	....	5 25	6 45	5 17	6 53	5 08	7 02	4 57	7 12
13	Sun...	4 55	6 53	9 50	....	5 25	6 44	5 18	6 52	5 08	7 00	4 58	7 11
14	Mon..	4 57	6 52	10 23	....	5 26	6 43	5 18	6 50	5 10	6 59	4 59	7 09
15	Tue...	4 57	6 51	11 01	....	5 27	6 42	5 19	6 49	5 10	6 58	5 00	7 08
16	Wed..	4 58	6 49	11 43	....	5 27	6 41	5 20	6 48	5 11	6 56	5 02	7 06
17	Thur.	4 59	6 48	A.M.	....	5 28	6 40	5 21	6 47	5 12	6 55	5 03	7 05
18	Fri....	5 00	6 47	12 32	....	5 28	6 39	5 21	6 46	5 13	6 54	5 04	7 03
19	Sat....	5 01	6 45	1 27	....	5 29	6 38	5 22	6 45	5 14	6 52	5 05	7 01
20	Sun...	5 02	6 44	2 30	....	5 30	6 37	5 23	6 44	5 15	6 51	5 06	7 00
21	Mon...	5 03	6 43	3 37	....	5 30	6 36	5 24	6 42	5 16	6 50	5 08	6 58
22	Tue...	5 04	6 42	4 48	P.M.	5 31	6 35	5 24	6 41	5 17	6 48	5 09	6 56
23	Wed.	5 05	6 40	....	7 08	5 31	6 34	5 25	6 40	5 18	6 47	5 10	6 55
24	Thur	5 07	6 38	....	7 46	5 32	6 32	5 26	6 38	5 19	6 45	5 11	6 53
25	Fri...	5 08	6 36	....	8 23	5 32	6 31	6 27	6 37	5 20	6 44	5 12	6 51
26	Sat...	5 09	6 34	....	9 01	5 33	6 30	5 27	6 36	5 21	6 42	5 14	6 50
27	Sun..	5 10	6 33	....	9 42	5 34	6 29	5 28	6 35	5 22	6 41	5 15	6 48
28	Mon...	5 11	6 31	....	10 25	5 34	6 28	5 29	6 33	5 23	6 39	5 16	6 46
29	Tue...	5 12	6 30	....	11 11	5 35	6 27	5 30	6 32	5 24	6 38	5 17	6 44
30	Wed..	5 13	6 28	....	A.M.	5 35	6 26	5 30	6 31	5 25	6 36	5 18	6 42
31	Thur..	5 14	6 26	....	12 01	5 36	6 25	5 31	6 29	5 26	6 34	5 19	6 41

To find the time of Sunrise and Sunset in other cities than Chicago, see table of corrections on page 30.

AUGUST WEATHER

August is slightly warmer than July in the Pacific region, and the average is about the same as July in other portions of the country; but, as a rule, the temperature averages lower toward the close of the month. The winds are usually as light as in July, but the humidity is higher, and this together with the high temperature causes sultry conditions sometimes known as "dog-days" in eastern and central districts. One of the most widespread hot waves in recent years experienced in the United States was that in August, 1918. It covered during the first week most of the country east of the Rockies, maxima of 110°, 108°, 102° and 106° being registered respectively at Omaha, Neb., Kansas City, Mo., New York City and Washington, D. C. Killing frost may occur in northern Minnesota and North Dakota as early as August 25, and light frost is not an uncommon occurrence during the latter part of August over the northern tier of States from Montana eastward to and including Michigan. August marks the beginning of the hurricane season in the tropics, and sometimes these storms strike the southern coast of the United States, either in the Gulf or on the South Atlantic. Dangerous gales and torrential rains accompany these storms. The rainfall, as a rule, does not vary much from that of July, except that droughts and hot winds are more frequent in the middle West; and sometimes droughts of midsummer reach their greatest intensity in August.



August.

The silent orchard aisles are sweet
  With smell of ripening fruit.
Through the sere grass, in shy retreat
Flutter, at coming feet,
  The robins strange and mute.
—William Dean Howells.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

Aug. 6.	Transfiguration.
Aug. 7.	Name of Jesus.
Aug. 15.	Assumption B. V. M.
Aug. 24.	St. Bartholomew.
Aug. 29.	John the Baptist beheaded.

AINT NATURE GRAND?
YES IT AINT!
IF YOU DON'T STOP SPLASHING WATER ON ME - GEORGE I'LL GET RIGHT OUT - SO THERE!!
SUIT YOURSELF, MILDRED
FORE!
4
CIRCUS DAY
PAPA BUY ME ONE LIKE THAT
THESE ARE THE DOGGY DAYS!

9th Month—SEPTEMBER, 1922—30 Days

Full Moon, Sept. 6, 1:47 A. M. **New Moon, Sept. 20, 10:38 P. M.**
Last Quar., Sept. 14, 4:20 A. M. **First Quar., Sept. 27, 4:40 P. M.**

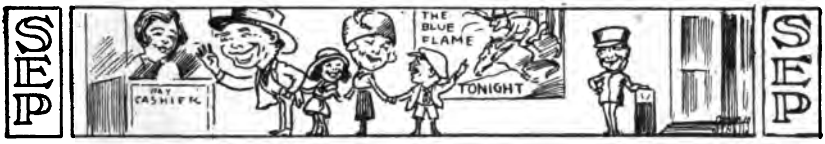
CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					A.M.								
1	Fri....	5 15	6 25	....	12 54	5 36	6 23	5 32	6 28	5 27	6 33	5 21	6 39
2	Sat....	5 16	6 23	....	1 48	5 37	6 22	5 32	6 26	5 28	6 31	5 22	6 37
3	Sun....	5 16	6 22	....	2 45	5 37	6 21	5 33	6 25	5 28	6 30	5 23	6 35
4	Mon..	5 17	6 20	P.M.	3 42	5 38	6 20	5 34	6 24	5 29	6 28	5 24	6 33
5	Tue...	5 18	6 19	5 53	4 39	5 38	6 19	5 35	6 22	5 30	6 27	5 25	6 32
6	Wed..	5 19	6 17	6 24	5 36	5 39	6 17	5 36	6 21	5 31	6 25	5 27	6 30
7	Thur.	5 21	6 15	6 54	....	5 40	6 16	5 36	6 20	5 32	6 23	5 28	6 28
8	Fri....	5 22	6 13	7 23	....	5 40	6 15	5 37	6 18	5 33	6 22	5 29	6 26
9	Sat....	5 23	6 11	7 53	....	5 41	6 14	5 38	6 17	5 34	6 20	5 30	6 24
10	Sun...	5 24	6 09	8 25	....	5 41	6 12	5 38	6 15	5 35	6 18	5 31	6 22
11	Mon..	5 25	6 08	9 00	....	5 42	6 11	5 39	6 14	5 36	6 17	5 33	6 20
12	Tue...	5 26	6 06	9 39	....	5 42	6 10	5 40	6 12	5 37	6 15	5 34	6 18
13	Wed..	5 27	6 05	10 24	....	5 43	6 09	5 41	6 11	5 38	6 14	5 35	6 16
14	Thur.	5 28	6 03	11 15	....	5 43	6 08	5 41	6 10	5 39	6 12	5 36	6 15
15	Fri....	5 29	6 01	A.M.	....	5 44	6 06	5 42	6 08	5 40	6 10	5 37	6 13
16	Sat....	5 30	6 00	12 12	....	5 44	6 05	5 43	6 07	5 41	6 09	5 39	6 11
17	Sun...	5 31	5 58	1 15	....	5 45	6 04	5 44	6 05	5 42	6 07	5 40	6 09
18	Mon..	5 32	5 56	2 23	....	5 46	6 03	5 44	6 04	5 43	6 05	5 41	6 07
19	Tue...	5 34	5 54	3 35	....	5 46	6 01	5 45	6 02	5 44	6 04	5 42	6 05
20	Wed..	5 35	5 52	4 49	P.M.	5 47	6 00	5 46	6 01	5 45	6 02	5 43	6 03
21	Thur	5 36	5 50	....	6 16	5 47	5 59	5 46	6 00	5 46	6 00	5 45	6 01
22	Fri....	5 36	5 49	....	6 54	5 48	5 58	5 47	5 58	5 46	5 59	5 46	5 59
23	Sat....	5 38	5 47	....	7 36	5 48	5 56	5 48	5 57	5 48	5 57	5 47	5 57
24	Sun....	5 38	5 45	....	8 20	5 49	5 55	5 49	5 55	5 48	5 55	5 48	5 56
25	Mon...	5 39	5 44	....	9 06	5 49	5 54	5 49	5 54	5 49	5 54	5 49	5 54
26	Tue....	5 40	5 42	....	9 56	5 50	5 53	5 50	5 52	5 50	5 52	5 51	5 52
27	Wed..	5 41	5 40	....	10 49	5 50	5 51	5 51	5 51	5 51	5 50	5 52	5 50
28	Thur.	5 42	5 39	....	11 44	5 51	5 50	5 52	5 50	5 52	5 49	5 53	5 48
29	Fri.....	5 43	5 37	....	A.M.	5 52	5 49	5 52	5 48	5 53	5 47	5 54	5 46
30	Sat.....	5 44	5 35	....	12 39	5 52	5 48	5 53	5 47	5 54	5 45	5 56	5 44

To find the time of Sunrise and Sunset in other cities than Chicago, see table of corrections on page 30.

SEPTEMBER WEATHER

September, the first month of the autumn, averages much cooler than either July or August in nearly all sections, the temperature during the closing days of the month being much lower than the first decade; but the mean temperature along portions of the California coast is higher in September than in August, due to the retarding influence of the Pacific. Occasionally hot waves occur in the Middle States during the first half of September, but they are rare and ordinarily of short duration. Maxima of 100° have been registered at several points on the Great Plains and at a few places east of the Mississippi Valley. On the average killing frosts in autumn occur from September 15 to September 25 in the Dakotas, Minnesota, northern Wisconsin and northern Michigan and the elevated mountain sections; and killing frosts have been recorded near the close of the month as far south as Tennessee, northern Arkansas and northern Oklahoma. The hurricane season in the tropics is at its height, and it is during the month of September that these storms are most likely to strike the southern coasts of the United States. The destructive Galveston hurricane occurred on September 8, 1900. There is a marked decrease in thunderstorm frequency. The rainfall is usually less in most districts, but there is an increase in rainfall along the east Florida coast, and although the dry season is still prevalent in the Pacific region, there is an increase in rainfall in the northern portion.



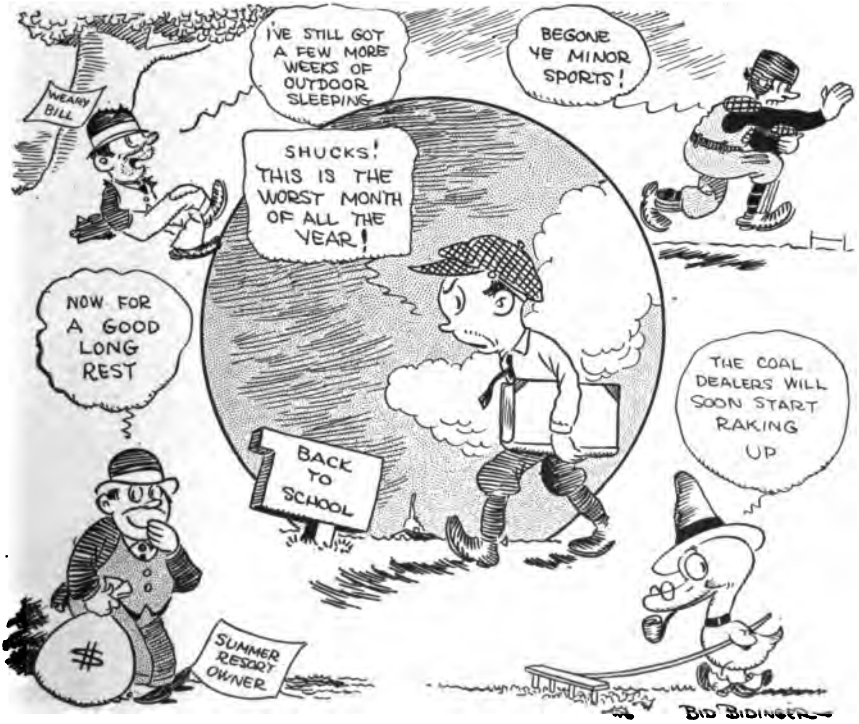
September.

I love to wander through the woodlands hoary
  In the soft light of an autumnal day
When summer gathers up her robes of glory
  And like a dream of beauty glides away.
—Sarah Helen Whitman.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

Sept. 4.	Labor Day.	Sept. 22.	Indian Day.
Sept. 8.	Nativity of Mary.	Sept. 23.	Hebrew New Year (Rosh Hashanah).
Sept. 14.	Exaltation of Holy Cross.		
Sept. 21.	St. Matthew.	Sept. 29.	Michaelmas.

Ember Days—Sept. 20, 22 and 23.


WEARY BILL
I'VE STILL GOT A FEW MORE WEEKS OF OUTDOOR SLEEPING
SHUCKS! THIS IS THE WORST MONTH OF ALL THE YEAR!
BEGONE YE MINOR SPORTS!
NOW FOR A GOOD LONG REST
BACK TO SCHOOL
THE COAL DEALERS WILL SOON START RAKING UP
$
SUMMER RESORT OWNER
BUD BIDINGER

10th Month—OCTOBER, 1922—31 Days

Full Moon, Oct. 5, 6:58 P. M. **New Moon, Oct. 20, 7:40 A. M.**
Last Quar., Oct. 13, 3:55 P. M. **First Quar., Oct. 27, 7:26 A. M.**

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					A.M.								
1	Sun...	5 45	5 33	....	1 35	5 53	5 47	5 54	5 45	5 55	5 44	5 57	5 42
2	Mon..	5 46	5 31	....	2 33	5 53	5 45	5 55	5 44	5 56	5 42	5 58	5 40
3	Tue...	5 47	5 30	....	3 30	5 54	5 44	5 56	5 42	5 57	5 41	5 59	5 38
4	Wed..	5 48	5 28	P.M.	4 26	5 54	5 43	5 56	5 41	5 58	5 39	6 00	5 37
5	Thur.	5 49	5 26	5 26	5 23	5 55	5 42	5 57	5 40	5 59	5 37	6 02	5 35
6	Fri....	5 50	5 25	5 56	....	5 56	5 41	5 58	5 38	6 00	5 36	6 03	5 33
7	Sat....	5 52	5 23	6 27	....	5 56	5 39	5 59	5 37	6 01	5 34	6 04	5 31
8	Sun...	5 53	5 22	7 01	....	5 57	5 38	6 00	5 36	6 02	5 33	6 06	5 29
9	Mon..	5 54	5 20	7 38	....	5 58	5 37	6 00	5 34	6 03	5 31	6 07	5 28
10	Tue...	5 55	5 19	8 21	....	5 58	5 36	6 01	5 33	6 04	5 30	6 08	5 26
11	Wed..	5 56	5 17	9 09	....	5 59	5 35	6 02	5 32	6 05	5 28	6 09	5 24
12	Thur.	5 57	5 15	10 02	....	5 59	5 34	6 03	5 30	6 06	5 26	6 11	5 22
13	Fri....	5 58	5 13	11 01	....	6 00	5 32	6 04	5 29	6 07	5 25	6 12	5 20
14	Sat....	5 59	5 11	A.M.	....	6 01	5 31	6 04	5 28	6 08	5 23	6 13	5 18
15	Sun...	6 00	5 10	12 05	....	6 01	5 30	6 05	5 26	6 10	5 22	6 14	5 17
16	Mon..	6 02	5 08	1 12	....	6 02	5 29	6 06	5 25	6 10	5 20	6 16	5 15
17	Tue...	6 04	5 07	2 23	....	6 03	5 28	6 07	5 24	6 12	5 19	6 17	5 13
18	Wed..	6 05	5 05	3 35	....	6 03	5 27	6 08	5 23	6 13	5 17	6 18	5 12
19	Thur.	6 06	5 04	4 49	P.M.	6 04	5 26	6 09	5 21	6 14	5 16	6 20	5 10
20	Fri....	6 07	5 02	6 03	5 26	6 04	5 25	6 09	5 20	6 15	5 14	6 21	5 08
21	Sat....	6 08	5 01	....	6 09	6 05	5 24	6 10	5 19	6 16	5 13	6 22	5 06
22	Sun...	6 09	5 00	....	6 54	6 06	5 23	6 11	5 18	6 17	5 12	6 24	5 05
23	Mon...	6 10	4 58	....	7 44	6 07	5 22	6 12	5 16	6 18	5 10	6 25	5 03
24	Tue...	6 11	4 57	....	8 38	6 07	5 21	6 13	5 15	6 19	5 09	6 26	5 02
25	Wed..	6 12	4 56	....	9 34	6 08	5 20	6 14	5 14	6 20	5 08	6 28	5 00
26	Thur.	6 13	4 54	....	10 31	6 09	5 19	6 15	5 13	6 21	5 06	6 29	4 58
27	Fri....	6 14	4 52	....	11 29	6 10	5 18	6 16	5 12	6 22	5 05	6 30	4 57
28	Sat.....	6 16	4 51	....	A.M.	6 10	5 17	6 17	5 11	6 24	5 04	6 32	4 55
29	Sun....	6 18	4 49	....	12 25	6 11	5 16	6 18	5 10	6 25	5 02	6 33	4 54
30	Mon...	6 19	4 48	....	1 23	6 12	5 15	6 18	5 09	6 26	5 01	6 35	4 52
31	Tue...	6 20	4 47	....	2 19	6 12	5 14	6 19	5 08	6 27	5 00	6 36	4 51

To find the time of Sunrise and Sunset in other cities than Chicago, see table of corrections on page 30.

OCTOBER WEATHER

The mean temperature of October averages considerably lower than September, at some points the difference being 12° to 14°, especially in the central portions of the country. While the October mean temperature at San Francisco is lower than September, it is nevertheless higher than any of the summer months. Freezing temperatures occur on the average quite generally throughout the Middle States, and usually as far south as the northern portions of the Gulf States by the end of the month, but never reaching the coast. Temperatures below zero are seldom registered even in northern sections, but Havre, Mont., has a record of 16° below zero on October 13, 1881. There is a marked increase in the amount of precipitation in the Pacific States as the rainy season progresses.. At the same time in other sections of the country there is a considerable decrease in rainfall. The season of snowfall begins in October in the Northern States, but the amounts are usually small, except in the higher levels. The general storm movement is more frequent and the winds in most eastern and central districts show an increase. October, as well as September, is the month for hurricanes in the tropics. Occasionally droughts in the summer and fall culminate in October, and, as most trees and shrubs become defoliated during the month, forest fires are often started because of the comparative dryness. These conditions produce the hazy atmosphere which is known as Indian summer.

October.

There is something in October sets the gypsy blood astir,
We must rise and follow her,
When from every hill of flame
She calls and calls each vagabond by name.
—Bliss Carman.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

Oct. 2.	Day of Atonement (Yom Kippur).
Oct. 7.	First Day of Tabernacles. (Sucoth).
Oct. 9.	Fire Prevention Day.
Oct. 12.	Columbus Day.
Oct. 18.	St. Luke.
Oct. 28.	Simon and Jude.
Oct. 31.	Hallowe'en.

YOU KNOW ME!
WORLD SERIES
FATHER'LL BE A WISE MAN IF HE KNOWS HIS OWN SON TONIGHT
IT'S ABOUT TIME FOR ME TO BEAT IT TO THE TALL TIMBERS!
?
ARE YOU PRACTICING SOME OF THOSE NEW DANCE STEPS ARTHUR?
NO—THAT NEW WOOLEN UNDERWEAR IS JUST DRIVING ME CRAZY
THE FOOTBALL COACHES ARE STARTING TO FIRE THE DRAWBACKS
BID BIDINGER

11th Month—NOVEMBER, 1922—30 Days

Full Moon, Nov. 4, 12:37 P. M. **New Moon, Nov. 18, 6:06 P. M.**
Last Quar., Nov. 12, 1:53 A. M. **First Quar., Nov. 26, 2:15 A. M.**

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					A.M.								
1	Wed..	6 21	4 46	....	3 16	6 13	5 14	6 20	5 07	6 28	4 59	6 37	4 50
2	Thur.	6 22	4 45	P.M.	4 12	6 14	5 13	6 21	5 06	6 29	4 58	6 39	4 48
3	Fri....	6 23	4 43	4 28	5 09	6 15	5 12	6 22	5 05	6 30	4 56	6 40	4 47
4	Sat....	6 25	4 42	5 04	6 06	6 16	5 11	6 23	5 04	6 32	4 55	6 41	4 45
5	Sun...	6 26	4 41	5 39	7 04	6 16	5 11	6 24	5 03	6 33	4 54	6 43	4 44
6	Mon..	6 27	4 40	6 19	....	6 17	5 10	6 25	5 02	6 34	4 53	6 44	4 43
7	Tue...	6 28	4 39	7 06	....	6 18	5 09	6 26	5 01	6 35	4 52	6 46	4 41
8	Wed..	6 29	4 38	7 57	....	6 19	5 08	6 27	5 00	6 36	4 51	6 47	4 40
9	Thur.	6 30	4 37	8 54	....	6 20	5 08	6 28	5 00	6 37	4 50	6 48	4 39
10	Fri....	6 31	4 36	9 55	....	6 20	5 07	6 29	4 59	6 38	4 49	6 50	4 38
11	Sat....	6 33	4 35	11 00	....	6 21	5 07	6 30	4 58	6 40	4 48	6 51	4 36
12	Sun...	6 34	4 34	A.M.	....	6 22	5 06	6 31	4 57	6 41	4 47	6 52	4 35
13	Mon..	6 35	4 33	12 07	....	6 23	5 06	6 32	4 56	6 42	4 46	6 54	4 34
14	Tue...	6 37	4 32	1 16	....	6 24	5 05	6 33	4 56	6 43	4 45	6 55	4 33
15	Wed..	6 38	4 31	2 27	....	6 25	5 04	6 34	4 55	6 44	4 44	6 57	4 32
16	Thur.	6 39	4 30	3 39	....	6 25	5 04	6 35	4 55	6 45	4 44	6 58	4 31
17	Fri....	6 41	4 29	4 51	P.M.	6 26	5 03	6 36	4 54	6 47	4 43	6 59	4 30
18	Sat....	6 42	4 28	5 56	4 41	6 27	5 03	6 37	4 53	6 48	4 42	7 01	4 29
19	Sun...	6 43	4 28	7 03	5 29	6 28	5 03	6 38	4 53	6 49	4 42	7 02	4 28
20	Mon..	6 44	4 27	....	6 22	6 29	5 02	6 39	4 52	6 50	4 41	7 03	4 27
21	Tue...	6 45	4 26	....	7 19	6 30	5 02	6 40	4 52	6 51	4 40	7 04	4 26
22	Wed..	6 46	4 25	....	8 17	6 30	5 02	6 40	4 51	6 52	4 40	7 06	4 26
23	Thur.	6 47	4 24	....	9 16	6 31	5 01	6 42	4 51	6 53	4 39	7 07	4 25
24	Fri....	6 48	4 23	....	10 14	6 32	5 01	6 42	4 50	6 54	4 38	7 08	4 24
25	Sat....	6 50	4 23	....	11 14	6 33	5 01	6 44	4 50	6 56	4 38	7 10	4 24
26	Sun...	6 50	4 23	....	A.M.	6 34	5 01	6 44	4 50	6 56	4 38	7 11	4 23
27	Mon...	6 52	4 22	....	12 10	6 34	5 00	6 45	4 50	6 58	4 37	7 12	4 22
28	Tue...	6 54	4 22	....	1 06	6 35	5 00	6 46	4 49	6 59	4 37	7 14	4 22
29	Wed..	6 55	4 21	....	2 02	6 36	5 00	6 47	4 49	7 00	4 36	7 15	4 21
30	Thur.	6 56	4 21	....	2 59	6 37	5 00	6 48	4 49	7 01	4 36	7 16	4 21

To find the time of Sunrise and Sunset in other cities than Chicago, see table of corrections on page 30.

NOVEMBER WEATHER

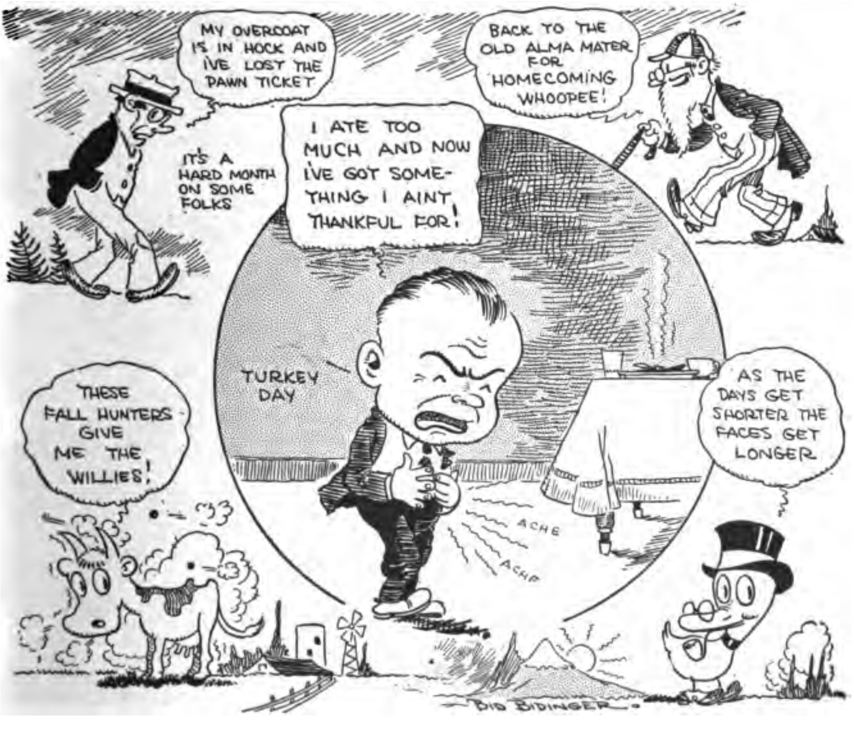
The November mean temperature in most districts is considerably lower than that of October, and while the difference is only 2° to 8° along the Pacific coast, the change amounts to 10° to 16° in the central valleys and to nearly 20° in the northern portion of the Great Plains. Cold waves begin to make their appearance in the Canadian Northwest and occasionally temperatures far below zero prevail there as well as in that portion of the United States lying immediately to the south. The waves lose force rapidly as they advance eastward and southward, and zero temperature has never occurred south of the 39th parallel, except on the Western Plains and at the higher elevations. On the average the first killing frost is recorded by November 1, as far south as the 34th parallel, and by November 25 close to the Gulf coast. The hurricane season in the tropics ends in November, but in that month is the advent of winter storms with rapid movement across the country, accompanied by gales in northern and central sections. Blizzards and northers sometimes prevail on the Western Plains, and there is an increase in snowfall. The wind velocity, as a rule, is much higher than in October, and there is a general increase in the frequency of gales. The rains continue to increase in the Pacific States, but in most sections of the country east of the Rockies there is a still further diminution in the amount of precipitation, although the storms are then of a more general character.

November.

No warmth, no cheerfulness, no healthful ease,
  No comfortable feel in any member—
No shade, no shine, no butterflies, no bees,
  No fruits, no flowers, no leaves, no birds—November.
.—Thomas Hood.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

Nov. 1. All Saints' Day.
Nov. 2. All Souls' Day.
Nov. 7. General Election Day (except in certain States).
Nov. 11. Martinmas.
Nov. 25. St. Catherine.
Nov. 30. Thanksgiving Day.
Nov. 30. St. Andrew.


MY OVERCOAT IS IN HOCK AND I'VE LOST THE PAWN TICKET
IT'S A HARD MONTH ON SOME FOLKS
I ATE TOO MUCH AND NOW I'VE GOT SOMETHING I AINT THANKFUL FOR!
BACK TO THE OLD ALMA MATER FOR HOMECOMING WHOOPEE!
TURKEY DAY
THESE FALL HUNTERS GIVE ME THE WILLIES!
ACHE
ACHE
AS THE DAYS GET SHORTER THE FACES GET LONGER
BID BIDINGER

12th Month—DECEMBER, 1922—31 Days

Full Moon, Dec. 4, 5:24 A. M. **New Moon, Dec. 18, 6:20 A. M.**
Last Quar., Dec. 11, 10:41 A. M. **First Quar., Dec. 25, 11:53 P. M.**

CENTRAL STANDARD TIME

		For Chicago (For other cities see page 30)				For Lat. +30°		For Lat. +35°		For Lat. +40°		For Lat. +45°	
		Sun rise	Sun set	Moon rise	Moon set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set	Sun rise	Sun set
					A.M.								
1	Fri....	6 57	4 21	....	3 57	6 38	5 00	6 49	4 49	7 02	4 36	7 17	4 20
2	Sat....	6 58	4 20	....	4 55	6 39	5 00	6 50	4 48	7 03	4 35	7 18	4 20
3	Sun...	6 59	4 20	P.M.	5 54	6 39	5 00	6 51	4 48	7 04	4 35	7 19	4 20
4	Mon..	7 00	4 20	5 04	6 51	6 40	5 00	6 52	4 48	7 05	4 35	7 20	4 19
5	Tue...	7 01	4 20	5 52	7 47	6 41	5 00	6 52	4 48	7 06	4 35	7 22	4 19
6	Wed..	7 02	4 20	6 48	....	6 42	5 00	6 53	4 48	7 07	4 35	7 23	4 19
7	Thur.	7 03	4 20	7 48	....	6 42	5 00	6 54	4 48	7 08	4 35	7 24	4 19
8	Fri....	7 04	4 20	8 52	....	6 43	5 00	6 55	4 48	7 09	4 35	7 25	4 18
9	Sat....	7 05	4 20	9 58	....	6 44	5 00	6 56	4 48	7 10	4 35	7 26	4 18
10	Sun....	7 05	4 20	11 06	....	6 45	5 01	6 57	4 49	7 10	4 35	7 27	4 18
11	Mon..	7 06	4 20	A.M.	....	6 45	5 01	6 57	4 49	7 11	4 35	7 28	4 18
12	Tue...	7 07	4 20	12 14	....	6 46	5 01	6 58	4 49	7 12	4 35	7 28	4 18
13	Wed..	7 08	4 20	1 23	....	6 47	5 01	6 59	4 49	7 13	4 35	7 29	4 18
14	Thur.	7 09	4 20	2 33	....	6 47	5 02	7 00	4 49	7 14	4 35	7 31	4 19
15	Fri....	7 09	4 21	3 43	....	6 48	5 02	7 00	4 50	7 14	4 36	7 32	4 19
16	Sat....	7 10	4 21	4 52	....	6 49	5 02	7 01	4 50	7 15	4 36	7 32	4 19
17	Sun...	7 11	4 21	5 58	P.M.	6 49	5 03	7 02	4 50	7 16	4 36	7 33	4 19
18	Mon...	7 11	4 21	6 58	5 01	6 50	5 03	7 02	4 51	7 16	4 36	7 34	4 20
19	Tue...	7 12	4 22	....	6 00	6 50	5 03	7 03	4 51	7 17	4 37	7 34	4 20
20	Wed..	7 12	4 22	....	6 59	6 51	5 04	7 03	4 52	7 17	4 37	7 35	4 20
21	Thur.	7 13	4 23	....	8 00	6 52	5 04	7 04	4 52	7 18	4 38	7 35	4 21
22	Fri....	7 13	4 23	....	8 59	6 52	5 05	7 04	4 52	7 18	4 38	7 36	4 21
23	Sat....	7 14	4 24	....	9 57	6 52	5 05	7 05	4 53	7 19	4 39	7 36	4 22
24	Sun....	7 15	4 24	....	10 55	6 53	5 06	7 05	4 54	7 20	4 39	7 37	4 22
25	Mon..	7 15	4 25	....	11 52	6 53	5 06	7 06	4 54	7 20	4 40	7 37	4 23
26	Tue...	7 15	4 25	....	A.M.	6 54	5 07	7 06	4 55	7 20	4 40	7 38	4 24
27	Wed..	7 16	4 26	....	12 48	6 54	5 08	7 07	4 55	7 21	4 41	7 38	4 24
28	Thur.	7 16	4 27	....	1 45	6 55	5 08	7 07	4 56	7 21	4 42	7 38	4 25
29	Fri....	7 16	4 27	....	2 42	6 55	5 09	7 07	4 56	7 21	4 42	7 38	4 26
30	Sat....	7 17	4 28	....	3 40	6 55	5 09	7 08	4 57	7 22	4 43	7 38	4 27
31	Sun....	7 17	4 29	....	4 38	6 56	5 10	7 08	4 58	7 22	4 44	7 38	4 27

To find the time of Sunrise and Sunset in other cities than Chicago, see table of corrections on page 30.

DECEMBER WEATHER

December, the first winter month, is marked by the movement of cold waves more or less severe over most of the country east of the Rocky Mountains. Occasionally the coldest weather of the winter occurs in December in the northern Rocky Mountain region and adjoining districts. Freezing temperature on the average reaches the Gulf coast, and the average date of the first killing frost along the entire coast with the exception of the Florida peninsula is about December 1. The southern limit of zero temperature of record in interior sections reaches parallel 33° on the west and 36° on the east. December is a month of frequent storm movement, and there is a considerable increase in the amount of snowfall in the more northerly sections, although heavy snow rarely occurs elsewhere until January. Blizzards and northers are more frequent from the eastern Rocky Mountain slope to the Mississippi Valley. The Pacific coast district is in the midst of its rainy season, and the heaviest falls of the entire year usually occur in the northern portion, while in other sections of the United States the total precipitation, rain and melted snow, does not differ much from that of November. The month, as a whole, has a smaller percentage of possible sunshine than any other month of the year.

December.

> Send the ruddy firelight higher;
> Draw your easy-chair up nigher;
> Through the winter bleak and chill
> We may have our summer still.
> —Ina Donna Coolbrith.

HOLIDAYS—CHURCH DAYS—ANNIVERSARIES

Dec. 3.	First Sunday in Advent.	Dec. 26.	St. Stephen.
Dec. 8.	Immaculate Conception B. V. M.	Dec. 27.	St. John the Evangelist.
Dec. 21.	St. Thomas.	Dec. 28.	Holy Innocents.
Dec. 25.	Christmas Day.	Dec. 31.	St. Sylvester.

Ember Days—Dec. 20, 22 and 23.

IT'LL COST YOU A LITTLE PIECE OF CHANGE IF YOU WANT ME TO PUT ON MY ACT AGAIN THIS YEAR
WINTER JOYS MAKE HEALTHY BOYS
THERE'S ONLY ONE WAY TO "GO ON A SKATE" NOW
DAD
BUD BISINGER

TABLE OF CORRECTIONS IN MINUTES FOR SUNRISE AND SUNSET

Lat. 30°	Add	Subtract
Charleston, S. C.	19m	
Dallas, Tex.	27	
Galveston, Tex.	19	
Houston, Tex.	21	
New Orleans, La.	00	
San Antonio, Tex.	34	
Tampa, Fla.	30	
Lat. 35°		
Atlanta, Ga.—E. T.	38	
Atlanta, Ga.—C. T.		22m
Albuquerque, N. M.	06	
Little Rock, Ark.	09	
Los Angeles, Cal.		07
Memphis, Tenn.	00	
Oklahoma City, Okla.	30	
Phoenix, Ariz.	28	
Richmond, Va.	10	
Lat. 40°		
Akron, Ohio	26	
Baltimore, Md.	06	
Boston, Mass.		16
Canton, Ohio	26	
Cheyenne, Wyo.		01
Cincinnati, Ohio—E. T.	38	
Cincinnati, Ohio—C. T.		22
Cleveland, Ohio	27	
Dayton, Ohio		23
Denver, Colo.	00	
Des Moines, Iowa	14	
Detroit, Mich.	22	
Indianapolis, Ind.		15m
Kansas City, Mo.	18m	
Lat. 40°		
Louisville, Ky.		17m
New York, N. Y.		04
Omaha, Neb.	24m	
Philadelphia, Pa.	01	
Pittsburgh, Pa.	20	
Providence, R. I.		14
Salt Lake City, Utah—C. T.	28	
Salt Lake City, Utah—M. T.		32
San Francisco, Cal.	10	
St. Louis, Mo.	01	
Springfield, Ill.	02	
Topeka, Kan.	23	
Washington, D. C.	08	
Youngstown, Ohio	23	
Lat. 45°		
Bismark, N. D.—C. T.	43	
Bismark, N. D.—M. T.		17
Boise, Idaho	15	
Buffalo, N. Y.	15	
Duluth, Minn.	08	
Helena, Mont.—M. T.	28	
Helena, Mont.—P. T.		32
Milwaukee, Wis.		08
Minneapolis, Minn.	13	
Pierre, S. Dak.—C. T.	41	
Pierre, S. Dak.—M. T.		19
Portland, Ore.	11	
Spokane, Wash.		10m
St. Paul, Minn.	12	
Utica, N. Y.	01m	

For any city not on this table the correction may be found by taking the difference in longitude of the city and the nearest standard meridian, expressed in time. This correction must be added when the city is WEST of the Standard meridian, and subtracted when it is EAST of the standard meridian. The longitudes of the standard meridians are: 5 hours, 75°; 6 hours, 90°; 7 hours, 105°; 8 hours, 120°.

DAYLIGHT-SAVING TIME

IMPORTANT NOTICE.—At present the use of daylight-saving time is so irregular, both as to localities and as to the period when it is in force, that no Almanac, necessarily published months in advance, can predict whether or not the clocks will be advanced during the summer of 1922 at any given locality. Accordingly Standard Time is employed throughout this Almanac. If daylight-saving time is in effect in your district in the summer of 1922, one hour should be added to all times indicated herein for the period while summer time is in effect there.

PERPETUAL CALENDAR

Suppose you want to know what day of the week the 12th of November, 1905, fell on; look under the table of years for 1905, and on the parallel line for the month of November. The figure 3 which you will find there refers to the columns of days below. Look in column 3 for the figure 12, and you will find that the 12th of November fell on Sunday.

1801 to 1952.											Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1801	1807	1818	1829	1835	1846	1857 1903	1863 1914	1874 1925	1885 1931	1891 1942	4	7	7	3	5	1	3	6	2	4	7	2
1802	1813	1819	1830	1841	1847	1858 1909	1869 1915	1875 1926	1886 1937	1897 1943	5	1	1	4	6	2	4	7	3	5	1	3
1803	1814	1825	1831	1842	1853	1859 1910	1870 1921	1881 1927	1887 1938	1898 1949	6	2	2	5	7	3	5	1	4	6	2	4
1805	1811	1822	1833	1839	1850 1901	1861 1907	1867 1918	1878 1929	1889 1935	1895 1946	2	5	5	1	3	6	1	4	7	2	5	7
1806	1817	1823	1834	1845	1851 1902	1862 1913	1873 1919	1879 1930	1890 1941	1947	3	6	6	2	4	7	2	5	1	3	6	1
1809	1815	1826	1837	1843	1854 1905	1865 1911	1871 1922	1882 1933	1893 1939	1899 1950	7	3	3	6	1	4	6	2	5	7	3	5
1810	1821	1827	1838	1849	1855	1866 1906	1877 1917	1883 1923	1894 1934	1900 1945 1951	1	4	4	7	2	5	7	3	6	1	4	6
Leap-Years.												29										
1804	1832	1860	1888		1928						7	3	4	7	2	5	7	3	6	1	4	6
1808	1836	1864	1892	1904	1932						5	1	2	5	7	3	5	1	4	6	2	4
1812	1840	1868	1896	1908	1936						3	6	7	3	5	1	3	6	2	4	7	2
1816	1844	1872		1912	1940						1	4	5	1	3	6	1	4	7	2	5	7
1820	1848	1876		1916	1944						6	2	3	6	1	4	6	2	5	7	3	5
1824	1852	1880		1920	1948						4	7	1	4	6	2	4	7	3	5	1	3
1828	1856	1884		1924	1952						2	5	6	2	4	7	2	5	1	3	6	1

1		2		3		4		5		6		7	
Monday	1	Tuesday	1	Wed.	1	Thursday	1	Friday	1	Saturday	1	Sunday	1
Tuesday	2	Wed.	2	Thursday	2	Friday	2	Saturday	2	Sunday	2	Monday	2
Wed.	3	Thursday	3	Friday	3	Saturday	3	Sunday	3	Monday	3	Tuesday	3
Thursday	4	Friday	4	Saturday	4	Sunday	4	Monday	4	Tuesday	4	Wed.	4
Friday	5	Saturday	5	Sunday	5	Monday	5	Tuesday	5	Wed.	5	Thursday	5
Saturday	6	Sunday	6	Monday	6	Tuesday	6	Wed.	6	Thursday	6	Friday	6
Sunday	7	Monday	7	Tuesday	7	Wed.	7	Thursday	7	Friday	7	Saturday	7
Monday	8	Tuesday	8	Wed.	8	Thursday	8	Friday	8	Saturday	8	Sunday	8
Tuesday	9	Wed.	9	Thursday	9	Friday	9	Saturday	9	Sunday	9	Monday	9
Wed.	10	Thursday	10	Friday	10	Saturday	10	Sunday	10	Monday	10	Tuesday	10
Thursday	11	Friday	11	Saturday	11	Sunday	11	Monday	11	Tuesday	11	Wed.	11
Friday	12	Saturday	12	Sunday	12	Monday	12	Tuesday	12	Wed.	12	Thursday	12
Saturday	13	Sunday	13	Monday	13	Tuesday	13	Wed.	13	Thursday	13	Friday	13
Sunday	14	Monday	14	Tuesday	14	Wed.	14	Thursday	14	Friday	14	Saturday	14
Monday	15	Tuesday	15	Wed.	15	Thursday	15	Friday	15	Saturday	15	Sunday	15
Tuesday	16	Wed.	16	Thursday	16	Friday	16	Saturday	16	Sunday	16	Monday	16
Wed.	17	Thursday	17	Friday	17	Saturday	17	Sunday	17	Monday	17	Tuesday	17
Thursday	18	Friday	18	Saturday	18	Sunday	18	Monday	18	Tuesday	18	Wed.	18
Friday	19	Saturday	19	Sunday	19	Monday	19	Tuesday	19	Wed.	19	Thursday	19
Saturday	20	Sunday	20	Monday	20	Tuesday	20	Wed.	20	Thursday	20	Friday	20
Sunday	21	Monday	21	Tuesday	21	Wed.	21	Thursday	21	Friday	21	Saturday	21
Monday	22	Tuesday	22	Wed.	22	Thursday	22	Friday	22	Saturday	22	Sunday	22
Tuesday	23	Wed.	23	Thursday	23	Friday	23	Saturday	23	Sunday	23	Monday	23
Wed.	24	Thursday	24	Friday	24	Saturday	24	Sunday	24	Monday	24	Tuesday	24
Thursday	25	Friday	25	Saturday	25	Sunday	25	Monday	25	Tuesday	25	Wed.	25
Friday	26	Saturday	26	Sunday	26	Monday	26	Tuesday	26	Wed.	26	Thursday	26
Saturday	27	Sunday	27	Monday	27	Tuesday	27	Wed.	27	Thursday	27	Friday	27
Sunday	28	Monday	28	Tuesday	28	Wed.	28	Thursday	28	Friday	28	Saturday	28
Monday	29	Tuesday	29	Wed.	29	Thursday	29	Friday	29	Saturday	29	Sunday	29
Tuesday	30	Wed.	30	Thursday	30	Friday	30	Saturday	30	Sunday	30	Monday	30
Wed.	31	Thursday	31	Friday	31	Saturday	31	Sunday	31	Monday	31	Tuesday	31

THE WORLD of ASTRONOMY

MODERN Civilization owes to no branch of Science a greater debt than to the oldest of the sciences, Astronomy. Every action in our lives which involves time, every engagement we make, every train or trolley, every factory whistle or school bell, depends upon the accurate observation of the stars, two or three times a week, at an observatory. The true time thus found is sent out by telegraph, telephone and wireless, chiefly from the U. S. Naval Observatory at Washington, and distributed to every railroad station and community in our land.

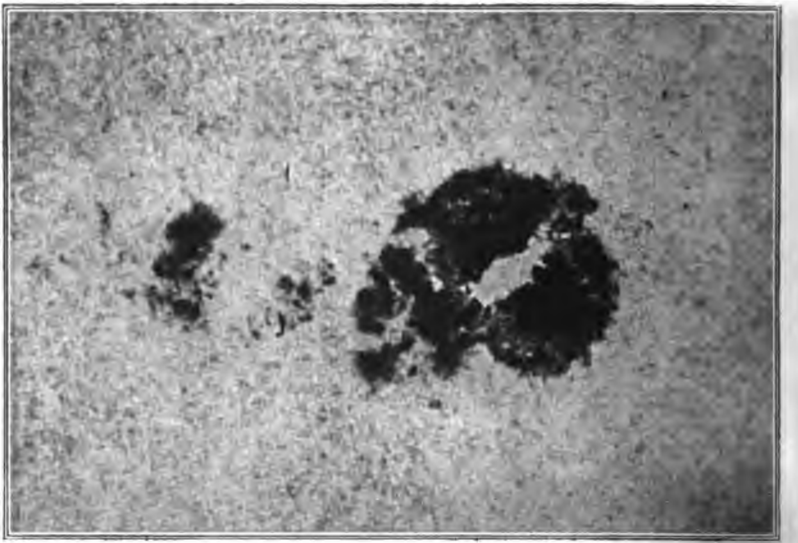
Further, every article of sea-borne commerce which comes to our tables or our stores—our morning coffee, much of our sugar, tea, and all imported textiles, the rubber for our automobile tires,—all these reach our ports safely only because the masters of the ships have faithfully measured the altitudes of the sun by day and of the stars by night and thus have determined their position and course over the seas; basing their calculations on the Nautical Almanac computed from astronomical observations. All travel by rail or by sea thus depends on astronomy.

But *place*, as well as *time*, depends on the measures of the stars. No parallel of latitude can be established except by setting up astronomical instruments for observations on one or two nights at successive points along the line, say a boundary between two states. Upon certain parallels and meridians established in a state depend all surveys; hence every acre of farm land and every foot of city property is defined by, and referred back to, precise observations of the stars. The compass does not point to the true north, but changes from place to place, more or less irregularly; and varies slowly and uncertainly at each place with the time. Hence surveys with a compass must always be checked by a true line determined from the sun or stars.

Quite aside from its indispensable service to civilization as above stated, astronomy also lifts the human mind to greater heights than any science; it opens broader horizons and nobler views. As the light and heat of the sun are free gifts to every creature on the earth, so, too, are the beauty and grandeur of the starry heavens the birthright of every human being blessed with sight. The study of the stars can bring only uplift to the minds of young and old.

THE SUN WITH NUMEROUS SUN-SPOTS

THE sun is a great globe of glowing matter, 866,000 miles in diameter, and turns on its axis in 27¼ days, as seen from the earth. It has 1,300,000 times the volume of the earth, but is only a quarter as dense; that is, its average density is about one and four-tenths that of water. A great part of the sun must be gaseous, and the spectroscope shows that the gases are those found on the earth, such as hydrogen and helium and vapors of calcium, magnesium, strontium, iron and of many other metals. The sun's temperature is not the same in different parts, but on the average would correspond to about 12,000 degrees Fahrenheit. The luminous intensity at the sun's surface is about 200,000 times that of a candle-flame, or two or three times that of the brightest part of an electric arc light. The energy of the radiation is equal to 12,000 horsepower continuously per square foot of the sun's surface. The earth moves around the sun, at a speed of nearly 19 miles per second, in a slightly elliptical orbit at an average distance of 92,900,000 miles. The earth is nearest to the sun on January first, and farthest (3 million miles farther) on July 1. The total gravitational pull of the sun on the earth would break a steel rod 3,000 miles in diameter.



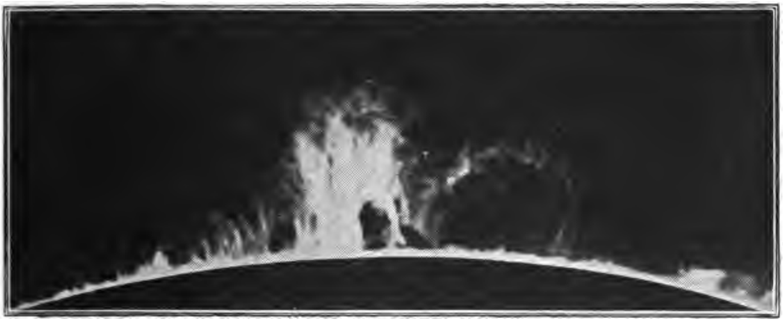
Sun-Spots Photographed in July, 1905

LARGE SUN-SPOTS

THE background of this photograph shows the peculiar mottled appearance of the visible surface of the sun. It has been thought that these markings are what we see of immense clouds of drops of liquid metals (perhaps largely carbon) constituting the sun's visible disk, known as the photosphere. Sun-spots may be briefly described as temporary breaks in the continuity of this cloud surface, corresponding somewhat to storms in the earth's atmosphere. This sun-spot was a very large one. The brilliant region stretching across the dark central portion is called a "bridge;" it resembles an intensely glowing tongue reaching from one side to the other, separating the spot into two smaller ones. A group of spots will sometimes cover 150,000 miles of the sun's surface; the darkest part, or umbra, may exceptionally be as much as 50,000 miles in diameter. The largest groups may be seen with the naked eye, and at a time of maximum frequency such are visible every few months. A sun-spot is dark only because it is compared with the wonderful brilliance of the sun's surface; actually the darkest spot is really brighter than most artificial lights.

The rotation of the sun was first learned from the motion of the spots over its surface; they often appear, fully developed, at the eastern edge of the sun, and pass across the disk, disappearing around the western edge, in about 13 days. Sometimes a spot lasts for only a few days; occasionally for a few months.

It has long been known that sun-spots are numerous at intervals of about 11 years. They were abundant, large and active at the maximum of 1917. Now they are diminishing in frequency, size and activity, and will continue to diminish for several years; a sun-spot minimum is to be expected in about 1924, when for days or weeks at a time no spots or very few and small ones will be observed. Then the sun may be expected to grow more active, so that by 1928 spots should be again very common. At times of solar maximum, the magnetism of the earth is also subject to frequent disturbances called "magnetic storms," which affect telegraph lines and cables, and are often accompanied by displays of "northern lights," or aurora. These not seldom occur when rapid changes are taking place in a large sun-spot or in a solar prominence.



A SOLAR PROMINENCE

WITH a sort of spectroscope known as the spectro-heliograph, photographs are taken of the surface and of the edge of the sun, using only a single ray of light from hydrogen, or from calcium vapor as in this case. Great eruptions are thus often found, which cannot be photographed or seen directly, except at time of total solar eclipse. This photograph was obtained with a violet ray of calcium vapor, and shows a solar "prominence" about 70,000 miles high, which covered about 150,000 miles of the edge of the sun. These eruptions may change their shape and height very rapidly, and sometimes they reach the extraordinary altitude of 500,000 miles from the sun's surface.

THE MOON

THE moon is the earth's own satellite. To a careless observer it might have the appearance of going around the earth daily from rising to setting, as the sun appears to do, but if the person watches the position of the moon from one night to the next, he will see that in twenty-four hours it has advanced eastward among the stars by about 13 degrees. This makes a complete turn in a month. While the earth is going around the sun in its orbit once a year, the moon is making nearly thirteen revolutions about the earth; thus both earth and moon go around the sun, and the daily rising and setting of both sun and moon of course have nothing to do with this revolution, but are due to the earth's turning on its axis once in twenty-four hours.

It is thought by some that the moon was at one time connected with the earth, when they were both in a fluid state, and that the moon has slowly receded from the earth. Whether this is true or not, there is much similarity between the surface of the moon and the surface of the earth, particularly in volcanic regions. There is no body in the heavens on which details of surface can be seen to compare in any way with the moon. The sufficient reason for this is because the moon is so very near to the earth, as compared with other astronomical objects, its average distance being only 239,000 miles, which is only about ten times the circumference of the earth. The diameter of the moon is 2,163 miles, or about a fourth that of the earth. Its density is only six-tenths the density of the earth, which is not far from the density of the rocks that are found on the surface of the earth. The moon's gravity is only about one-sixth that of the earth. Hence a volcanic eruption on the moon would be more violent than one on the earth and the walls of craters thus formed would naturally be relatively higher.

The excellent photograph of the moon here shown gives a good idea of its surface. There are large, flat areas, which reflect light less well than the rest of the surface, to which the name of "seas" was given in early times. It is known that there is no water on the moon at present, and indeed that it has no appreciable atmosphere. Hence it would be impossible for men or animals to live on the moon. If there ever was any water on the moon, then it is possible that these areas were the beds of oceans. There are several mountain ranges, the best known bearing the names of the "Alps" and the "Apennines." Large craters are very numerous on the moon, and it seems probable that they were of volcanic origin; some scientists have thought, however, that they were due to the result of violent impact by very large meteors. With the largest telescopes it is possible to see markings on the moon as small as two or three miles in diameter. The study of such photographs shows nothing but a desert waste, however, with very wild scenery. The effects on the earth due to water and atmosphere, known as erosion, are absent from the moon.

The moon turns on its axis in just the time that it revolves around the earth. We accordingly are never able to see more than about 60 per cent of the moon's surface.

The moon's change of phase is one of the most familiar things to all observers of the sky. Half of the moon is always illuminated by the sun, and only half. When the moon lies nearly in line between us and the sun—new moon—we can see only a small rim, half of a circle on the outside and half of an ellipse on the inside. When the moon has completed one quarter of its circuit or is about seven days old, which is known as first quarter, we see a half of the illuminated portion. When the moon is near full and is just opposite to the sun, rising at sunset, we see the whole of the portion illuminated by the sun, or full moon.

Everyone who is familiar with the ocean's tides is acquainted with the fact that they recur at intervals corresponding to the passage of the moon across the meridian, on the average 12 h. 26 m. between high tides. Also that at new moon and full moon, when the sun and moon are acting together in producing tides, the high tide is higher and the low tide is lower than at other times. The daily tides at such times, occurring twice a month, are called spring tides. At first and third quarter, when the tidal effects of the sun and moon are opposite to each other, the high tides are lower and the low tides are higher, so that the range of the daily tides is much less, twice in the month, at these ages of the moon.

JUPITER

JUPITER is the largest planet in the solar system, having 11 times the diameter of the earth. It is considerably flattened at the poles, as shown by the photograph. Although so much larger than the earth, it is nevertheless very much smaller than the sun, having less than 1/1000 the mass of the sun. Its density is only one-fourth that of the earth, or slightly greater than the density of water. It is therefore unlikely that it has any solid portion. The surface, as we see it, is like a great ball of clouds, across which chocolate-colored belts are seen, as in the photograph. These belts are more or less permanent, but nevertheless change considerably. The planet turns rapidly on its axis, so that its day is about 9 h. 55 m., but this differs at different distances from the planet's equator, which is another way of saying that it does not have a permanent surface.

Jupiter

The planet's distance from the sun is, on the average, 483 million miles. The least distance from the earth is 370 million miles, and when across the earth's orbit and across its own orbit from the earth, this distance becomes 600 million miles from the earth. The planet takes a little less than 12 years to make its journey around the sun; but seen from the earth, the planet comes around to opposition at intervals of 399 days. The planet is always visible to the naked eye when above the horizon at night, being brighter than a first-magnitude star. A small telescope will show that it has a disk and is not a point, and will reveal the markings. There are four large moons which can be seen in a very small telescope or a good field glass. These four are large objects, and are more or less in a straight line with the planet's equator. There are five other much smaller moons.

SATURN

SATURN is the most beautiful of the planets in our system. Its photograph adorns the cover of this Almanac. It is unusual among the planets because of the very remarkable rings which surround the ball of the planet, as is well shown on this drawing by Prof. Barnard. Saturn's diameter is about 73 thousand miles, or about 9 times that of the earth. Although the planet has a bulk (or volume) nearly 800 times that of the earth, its mass, or the amount of matter it contains, is less than 100 times that of the earth. Accordingly its density is ⅛ that of the earth, or considerably less than the density of water. This shows that the planet cannot be a solid body, and there are no permanent markings on the ball of the planet. From white spots that are occasionally seen, it has been found that the planet's day is about 10 h. 14 m. of our time. When nearest to the earth, the distance of the planet is about 774 million miles, while at the farthest it is slightly over one billion miles from the earth. Its average distance from the sun is 886 million miles. The planet goes around the sun in 29½ years, but it gets in opposition with the sun, as seen from the earth, every 378 days.

Saturn

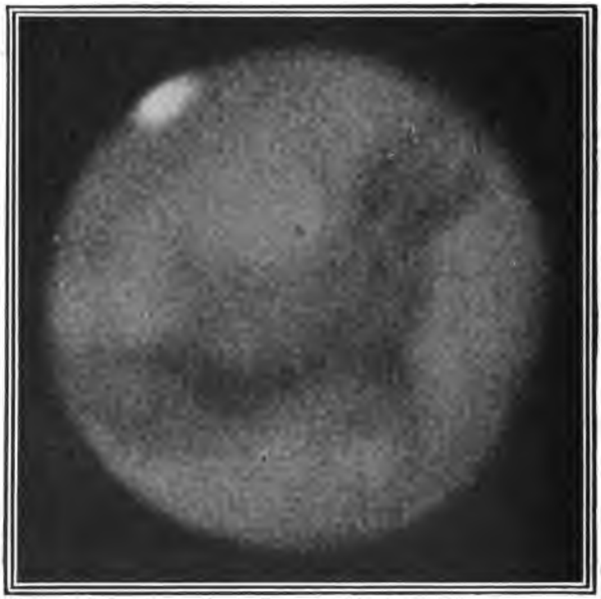
The rings have an extreme diameter of 173 thousand miles. There is a space of about 7,000 or 8,000 miles between the equator of the planet and the inner edge of the inner ring. The rings are very thin, probably considerably less than 100 miles. Twice in each 29 years the earth comes into the plane of the rings and for some weeks the rings, being edge on, can hardly be seen. This happened in the early part of 1921.

It has been proven by the spectroscope that the rings are made up merely of great multitudes of small moons, each going in its own orbit around the planet, under the law of gravitation. Besides these minute little moons forming the ring, the planet has ten large moons.

Saturn is a conspicuous object in the night sky, when favorably situated. It appears like a first-magnitude star. If you will watch it for several nights when it is near another bright star, you will readily see how it moves toward the star or away from it. This is also true of the other bright planets.

MARS

THE planet Mars is much smaller than the earth, having a diameter of only 4,200 miles. The density of the planet is about ¾ that of the earth, which indicates that it has a solid crust. It is the next planet of our system outside of the earth, just as Venus is the nearest planet inside of the earth's orbit. Under the most favorable circumstance, the planet comes within 35 million miles of the earth. The orbit of the planet is not a circle, but an ellipse, so that its distance from the earth at the time when in line with the sun varies very considerably at different revolutions. The planet is best seen when at "opposition," which means when it is opposite to the sun in the sky, rising at sunset and setting at sunrise. At such times it is visible during the whole night. Its actual distance from the sun is, on the average, 142 million miles. The planet requires 687 days to travel around its orbit; but 780 days elapse between the times when it is in line with the earth at superior conjunction, or between two oppositions. This is because the earth is going around the sun in the same direction, and their speed is more nearly alike than that of the other planets. Hence a long time is required for the two planets to get into line with the



sun. The surface of the planet shows some rather definite markings, as may be seen from this photograph. There are light portions and dark portions, which are permanent; but we do not positively know which parts represent land and which parts water, if any. It is thought that the light parts, which are of a reddish-yellow color, are covered with sand, being desert areas, and that the dark portions have enough moisture to grow considerable vegetation, giving the darker color. There are some rather narrow streaks seen under the best conditions, but not visible on these excellent photographs, to which at one time the name of canals was given. This should not be meant to imply that they were artificial. Possibly they are streaks of vegetation.

At the pole of the planet a small white spot, called the polar cap, may be seen. This changes in size according to the advance of the winter or summer season on the planet, evidently melting with the arrival of summer at that pole. The length of the planet's day is 24 hours 37 minutes. Mars has two very small moons.

TIMES OF RISING AND SETTING OF THE PLANETS

THESE times of rising and setting are computed for any standard meridian in the latitude of Chicago. They hold approximately for other latitudes on a standard meridian. For Chicago 10 minutes must be subtracted from all times given in the table, as a correction for longitude, and for any other city the corresponding correction may be taken from table on page 30.

	MERCURY		VENUS		MARS		JUPITER		SATURN	
	Rises	Sets	Rises	Sets	Rises	Sets	Rises	Sets	Rises	Sets
		P.M.	A.M.		A.M.		A.M.		P.M.	
Jan. 1	....	4 43	6 44	....	2 03	....	12 41	....	11 49	....
							P.M.	....		
15	....	5 37	6 57	....	1 43	....	11 45	....	10 49	....
Feb. 1	A.M.	6 32	7 02	P.M.	1 19	....	10 37	....	9 57	....
15	6 22	....	....	5 19	1 01	....	9 39	....	8 37	....
Mar. 1	5 18	....	....	5 54	12 40	....	8 41	....	7 39	....
15	5 09	....	....	6 32	12 21	....	7 43	....	6 44	....
					P.M.			A.M.		A.M.
Apr. 1	5 09	....	....	7 19	11 51	....	....	5 29	....	5 41
15	5 10	P.M.	....	7 55	11 19	....	....	5 04	....	4 47
May 1	....	7 38	....	8 36	10 33	....	....	4 00	....	3 44
15	....	8 54	....	9 06	9 40	A.M.	....	3 03	....	2 49
June 1	....	8 54	....	9 32	....	3 38	....	1 53	....	1 40
15	....	7 33	....	9 40	....	3 57	....	12 56	....	12 42
	A.M.							P.M.		P.M.
July 1	3 40	....	....	9 35	....	2 29	....	11 49	....	11 36
15	3 15	....	....	9 22	....	1 25	....	10 55	....	10 41
Aug. 1	4 19	....	....	8 58	....	12 25	....	9 53	....	9 36
		P.M.				P.M.				
15	....	7 21	....	8 34	....	11 49	....	8 54	....	8 44
Sept. 1	....	7 17	....	8 09	....	11 15	....	8 08	....	7 46
15	....	7 01	....	7 48	....	10 59	....	7 24	....	6 59
Oct. 1	A.M.	6 25	....	7 26	....	10 45	....	6 33	A.M.	6 06
15	6 32	....	....	7 06	....	10 40	A.M.	5 50	5 39	....
Nov. 1	5 14	....	....	6 24	....	10 33	6 13	....	4 43	....
15	6 00	....	A.M.	5 23	....	10 27	5 32	....	3 55	....
Dec. 1	4 29	P.M.	6 32	....	....	10 20	4 42	....	2 06	....
15	....	7 52	5 03	....	....	10 12	3 55	....	2 01	....

ECLIPSES

IN 1922 there are but two eclipses, both of the sun, one being annular, the other total. Neither will be visible in the United States. The first occurs on March 28 and will be seen over a narrow belt passing through part of Brazil, across the Atlantic, and through the desert of Sahara.

The total eclipse of the sun occurs on September 20. Its track, more than 100 miles wide (really the shadow of the moon), sweeps over the Indian Ocean and extends across the continent of Australia.

POSITIONS OF THE PLANETS

MERCURY.—This planet is always so close to the sun that it must be looked for near the horizon at sunset, close to the place where the sun disappeared, or at sunrise near the horizon, close to the place where the sun will appear. It looks like a first-magnitude star (see star charts) and may be identified certainly by observing that no star of this brightness should be in that position. Favorable times for observing the planet in the evening in 1922 are within a week of the following dates: Jan. 29, May 23, Sept. 19. For morning observations, Mar. 12, July 10, Oct. 30, 1922.

VENUS.—Venus is also found in the neighborhood of the sun, but may recede to greater distances (elongations) than Mercury. It will be found in the eastern sky in the morning before sunrise during the months of January and Dcember, and in the west after sunset during the remainder of the year 1922. It is easily identified as the brightest star in the sky at the time—Jupiter only approaching it in brilliance. The best time to look for it is from March to November in the western sky after sunset. The constellations (see charts) in which it will be found in 1922 are: March, *Pisces;* April, *Aries;* May, *Taurus;* June, *Gemini;* July, *Leo;* August, *Virgo;* September, *Virgo;* October, *Scorpio;* November, *Scorpio.*

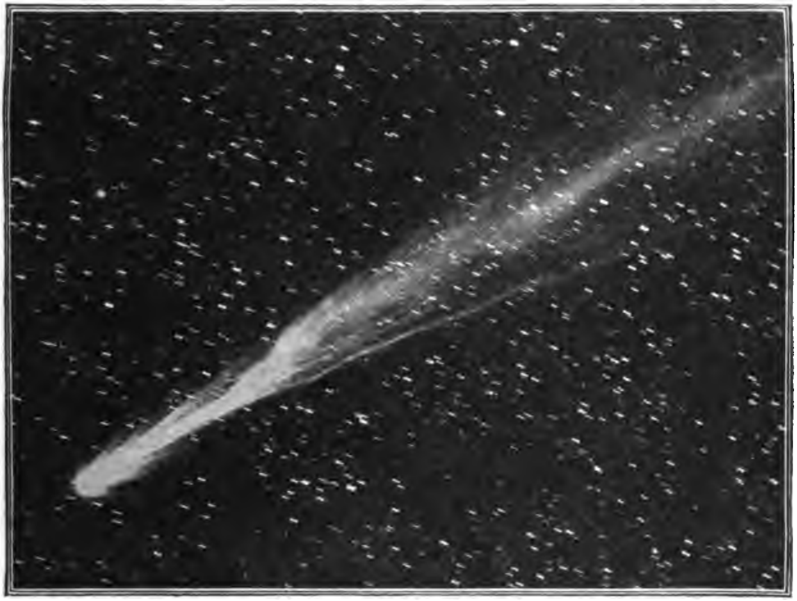
MARS.—The planet Mars will be in opposition to the sun June 10, 1922, at which time it will be closer to us than at any time since 1907. It is easily identified as a brilliant red star, brighter than any other in that part of the sky and of that color. It will be found in the following constellations: January, *Libra;* February, *Libra;* March, *Scorpio;* April, *Scorpio;* May, *Sagittarius;* June, *Sagittarius;* July, *Scorpio;* August, *Scorpio;* September, *Sagittarius;* October, *Sagittarius;* November, *Capricornus;* December, *Aquarius.*

JUPITER.—Jupiter appears as a brilliant white star, rivaling Venus in brightness. It will be found in the constellation Virgo throughout the year, near the first-magnitude star Spica. It will be in the evening sky from April 4 to October 23 and in the morning sky the rest of the year.

SATURN.—This planet is of a yellow color and appears of about the first magnitude. It will be easily found near Jupiter in the constellation Virgo throughout the year.

URANUS.—The planet is not visible to the naked eye unless the observer knows just where to look; but a field-glass is enough to show it. It moves forward in its orbit only about 4 degrees during the year, completing its whole circuit of the heavens in 84 years. It is never more than 4 degrees from the star Lambda Aquarii throughout 1922, and in March and again in October it is within one degree of that star.

NEPTUNE.—The planet Neptune is never visible without a fair-sized telescope. It remains in the constellation Cancer throughout 1922, not moving over 3 degrees from the faint star Pi of that constellation. It makes one revolution around the sun in 164 years, passing along close to the ecliptic through the twelve constellations of the zodiac.



A COMET

THIS picture of a comet discovered by Morehouse at Yerkes Observatory was photographed by Professor E. E. Barnard on Nov. 16, 1908, with an exposure of one hour. The comet moved very perceptibly during the hour, and it was necessary to move the telescope accordingly. Hence the images of the stars, instead of being round dots, are drawn out into streaks. That a comet is a very filmy thing is easily seen by looking at the stars which shine through the tail—a full million miles of it at some points—without any apparent loss of their usual light. The comet was 132 million miles distant from the earth when thus photographed, and was receding at a rate of over one and a half million miles per day.

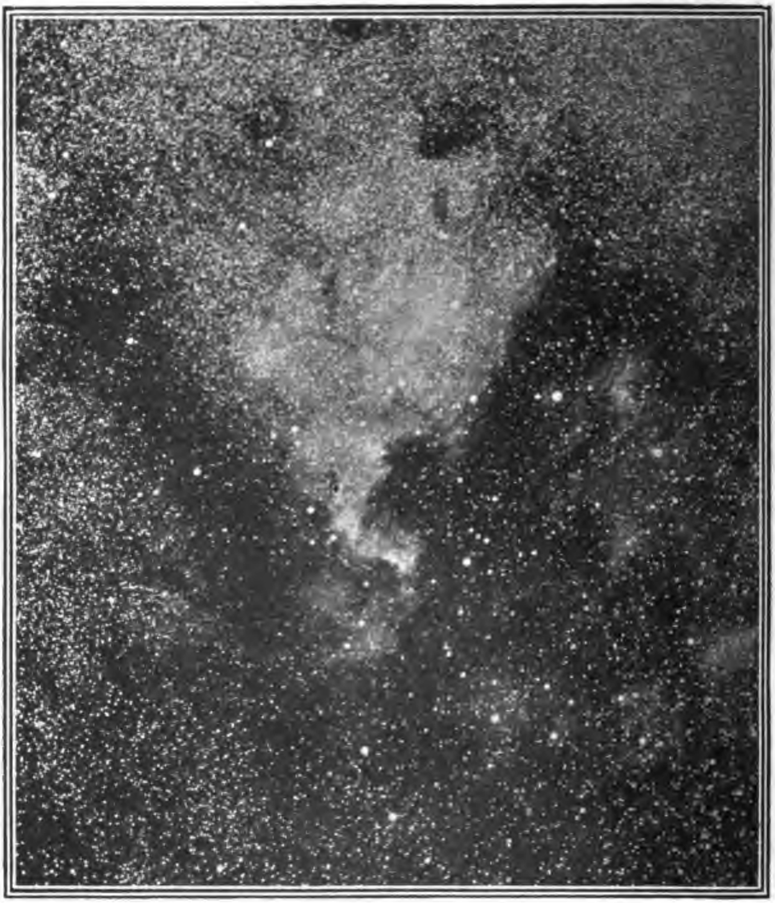
Comets are very big, even if filmy nothings, for the tail in this case can be traced on the photograph for over ten million miles. Sometimes they are 100 million miles long, farther than the distance from the earth to the sun. This comet was not visible to the eye, although its light always affected the photographic plate strongly. Its form changed decidedly from night to night. It was nearest to the sun on Christmas, 1908, at a distance of 88 million miles.

The spectroscope shows that comets' tails are gaseous, chiefly combinations of hydrogen, carbon and nitrogen, known as hydrocarbons, and cyanogen. It seems probable that the gas acetylene is the hydrocarbon generally present. In the heads of comets the vapors of metals like iron are occasionally found.

A comet is usually seen for only a few weeks or months. Its light diminishes as it recedes from the sun, and it goes out of the range of our telescope; but sometimes while under observation a comet may split up into separate smaller ones, which, perhaps, are never again observed as luminous objects.

THE NORTH AMERICA NEBULA

THIS great gaseous nebula in the constellation *Cygnus* (the Swan) was first photographed by Professor Max Wolf of Heidelberg. He christened it the America nebula; at the suggestion of Professor Barnard the name was modified to the "North America Nebula,"



and it has been so designated for the past twenty years. The resemblance is striking, but no two objects could be more different in their actual character. Instead of being a solid continent, the nebula is a vast mass of luminous gases, very likely having considerable internal motion. The gases are: (1) hydrogen, which is found almost without exception in every known self-luminous celestial object; (2) the gas next to hydrogen in order of lightness, helium, found in the sun by the spectroscope 27 years before the chemists located it in the earth; and (3) nebulum, a gas especially characteristic of the nebulæ (whence its name), but not yet found on the earth (or sun).

We cannot give an estimate in miles of the real size of the North America nebula without first knowing what is its distance from the earth, but we do know, from the angular distance between two points of the picture corresponding roughly to New York and San Francisco on the continent, that those two points are one-fortieth as far apart in miles as the distance of the nebula from the earth in miles. From the study of other nebulæ, we may assume that this object is not less than 100 light-years distant, and probably not more than 1,000 light-years; a light-year being the distance that light would travel in a year at its steady velocity of 11 million miles per minute. If we assume a distance of 500 light-years for the nebula, then the size of the nebula would be one thousand million times the scale of the North American continent.

The picture of the nebula given here was obtained by Professor E. E. Barnard, with an exposure of four hours, the Bruce photographic telescope of 10 inches aperture and 50 inches length being employed.

As may be inferred from the great number of stars surrounding the nebula, it is situated in the Milky Way. Its shape cannot be recognized in any telescope, however powerful, which well illustrates the wonderful advantage of photography for studying certain classes of celestial objects.

THE SEASONS, 1922

Date	Hour (Central Time)	Phenomena
Dec. 22, 1921	3:08 a. m.	Winter solstice (winter begins)
Mar. 21, 1922	3:49 a. m.	Vernal equinox (spring begins)
June 21, 1922	11:27 p. m.	Summer solstice (summer begins)
Sept. 23, 1922	2:10 p. m.	Autumnal equinox (autumn begins)
Dec. 22, 1922	8:57 a. m.	Winter solstice (winter begins)

A slave of the weather is liable to soon be a prisoner of the grave.

Even astronomers must look sharp that familiarity with the stars does not breed contempt.

The darkest cloud may be the first to disappear from the sky.

THE GIANT STAR BETELGEUX

THIS picture shows the brighter stars of the Constellation of Orion, photographed slightly out of focus so that the numerous faint stars, not visible to the naked eye, should be excluded. Near the left-hand upper corner is the giant star Alpha Orionis or Betelgeux. This is an orange star of the first magnitude which varies irregularly in brightness.

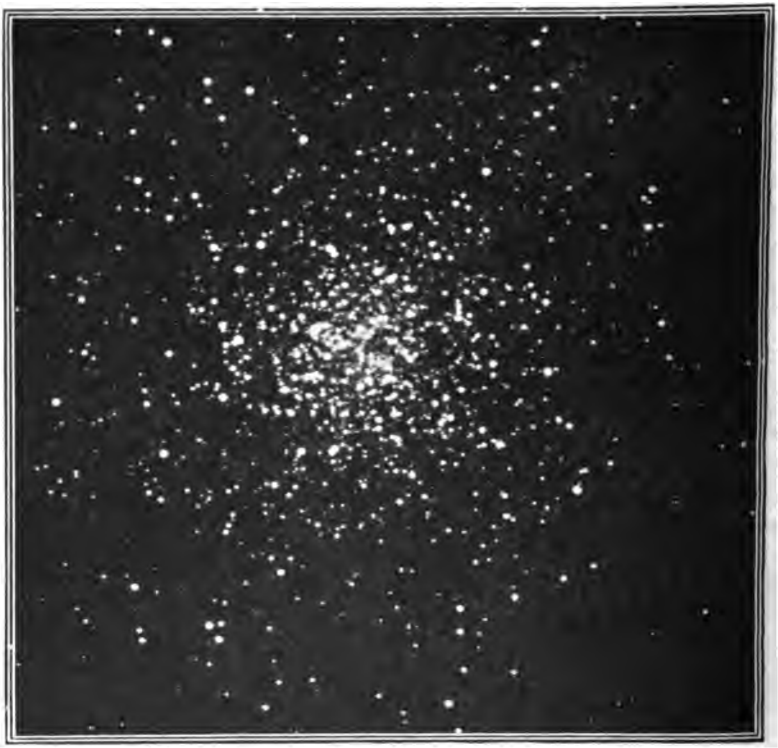
Many years ago Professor A. A. Michelson, of the University of Chicago, developing some ideas previously suggested by the French physicist Fizeau, proposed a method for measuring the diameters of very small celestial objects, the principle being based on the interference of light.

In 1919 Professor Michelson resumed his experiments on this subject, first trying interference with the 40-inch Yerkes refractor, covering the object-glass except for two rectangular openings at the ends of a diameter. Then he tried it with the 60-inch and 100-inch reflectors at Mt. Wilson, California; and the results were further confirmed. Accordingly a truss carrying two mirrors 18 feet apart was put over the mounting of the 100-inch telescope; the rays of light of a star coming from these two mirrors were brought together by reflection and so-called "interference fringes" were produced. By varying the distance between the mirrors, a point could be found indicating complete interference. The observers at Mt. Wilson were Messrs. Pease and Anderson. The methods used and results obtained are fully described by Michelson and Pease in a paper published in *The Astrophysical Journal* (Chicago) for May, 1921. At the end of 1920 they successfully measured the diameter of the star Betelgeux, finding it to be forty-six thousandths of a second (0.046). Other astronomers have attempted the difficult problem of determining the distance of this star, and the average of their results places the star over 13 million times as far from us as the sun, or about 1,250 million million miles away. From this it follows that the star's diameter is three times the distance from the earth to the sun, or about 280 million miles. Its volume or bulk will be 33 million times the volume of the sun. Alpha Orionis is thus a great fiery sphere large enough to fill all the space from the sun to the earth and out beyond to the orbit of Mars. When this famous red star of the winter sky is pointed out to the children, the old verse should be changed to

"Twinkle, twinkle, *giant* star,
How I wonder what you are."

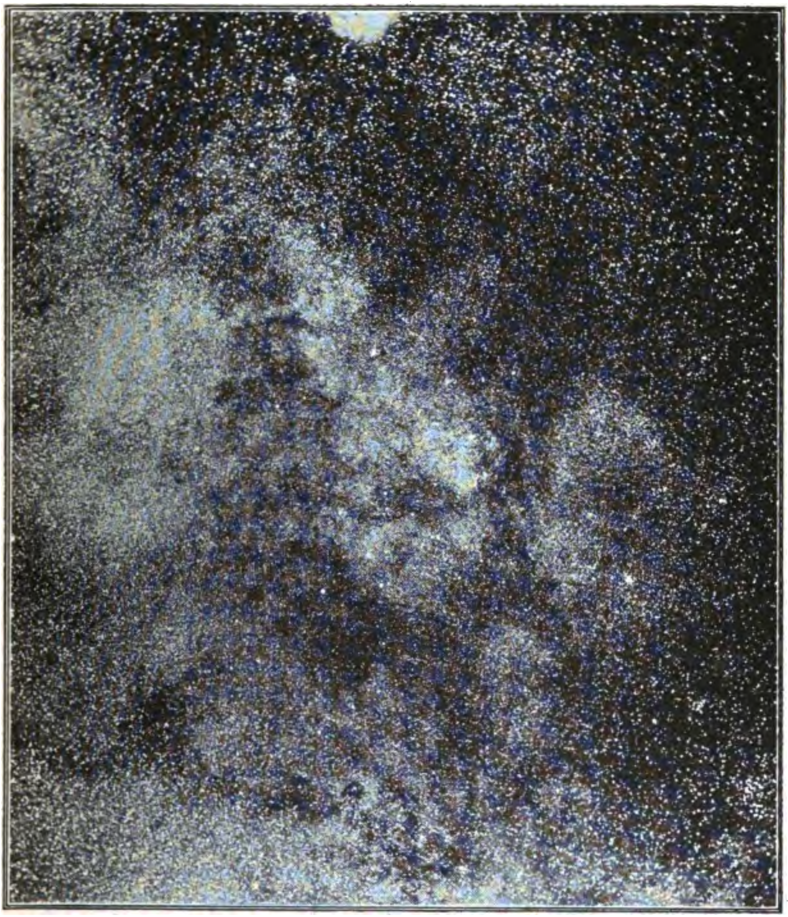
MAKING WATCHES

Some of the screws used in the process of watchmaking are so tiny they resemble dust. As many as 100,000 of them can be put into a lady's thimble. They are cut by a machine from steel wire only 4-1,000 of an inch in diameter, and as the chips fall it looks as though the operator were simply shaving the wire for his own amusement. No screws can be seen, and yet a screw is made at every third operation. Studied through a magnifying glass, it will be seen they are grooved at the proportion of 2600 threads to the inch. It is estimated a single machine turns out about a million a month. They are polished 10,000 at a time.



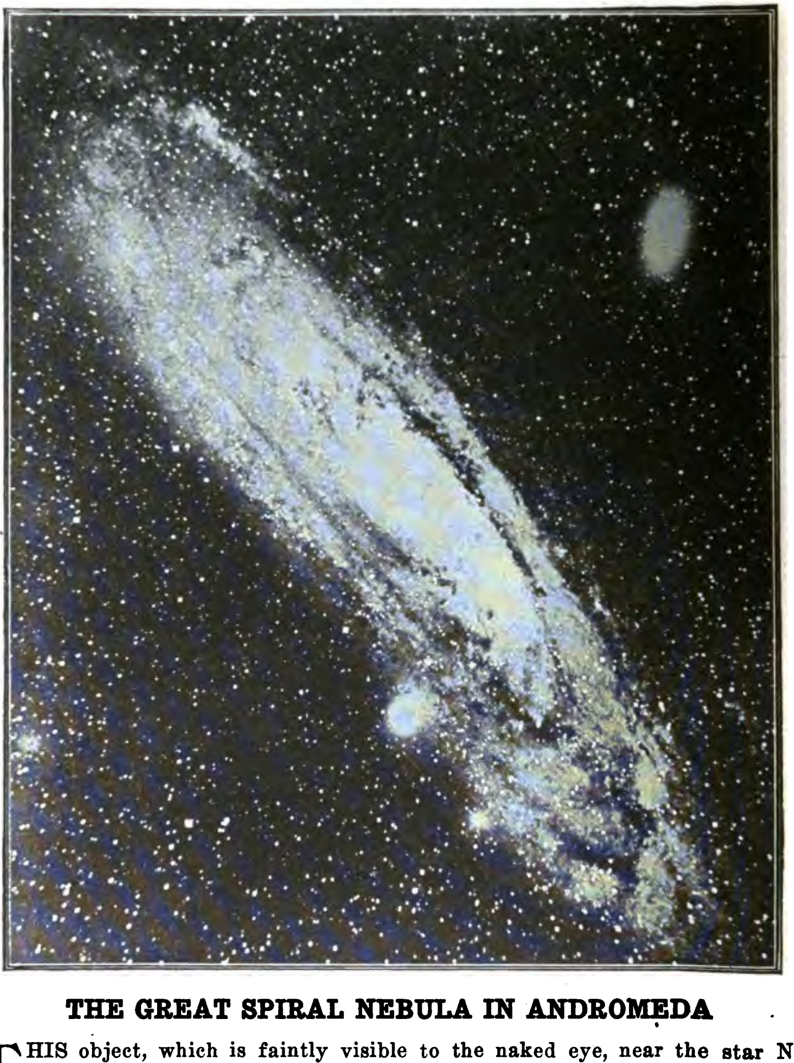
THE GREAT STAR CLUSTER IN HERCULES

THIS photograph, taken with the 40-inch telescope of the Yerkes Observatory, shows the great star cluster in the constellation Hercules. It is barely visible to the naked eye as a faint patch of light, if the observer knows just where to look. The picture shows, however, that it is made up of a great number of stars (or suns), none of which alone is visible to the naked eye. The cluster represents a great republic of suns, each acting under the control of all the others, without any central sun about which the others turn. It is estimated that the cluster contains the equivalent of a million of our suns, and a great many of them are much more brilliant than our own sun. The distance of each one from its nearest neighbor is immensely great, however, thousands of millions of miles, and the cluster is at such an enormous distance from us that these brilliant suns seem like faint stars, and at the center of the cluster they cannot be separately distinguished even in the largest telescope. A recent estimate of the distance of this cluster, which is subject to considerable uncertainty, places it so far away from us that the light traveling at 11 million miles per minute would require over 30 thousand years to reach us.



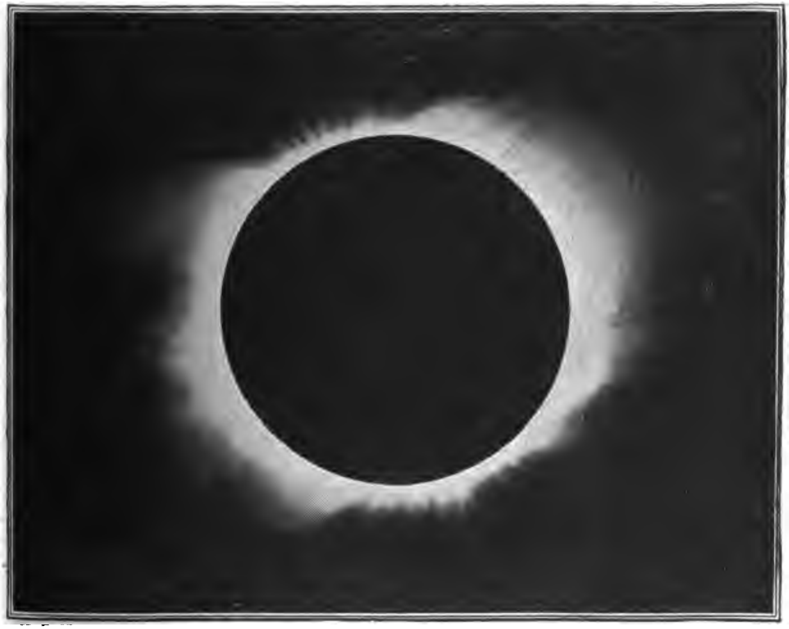
GREAT CLOUD OF STARS IN SAGITTARIUS

THIS is a photograph of a part of the Milky Way taken by Professor Barnard of the Yerkes Observatory with a photographic telescope 10 inches in diameter and 50 inches long. It shows a part of the Milky Way where the stars are specially numerous. The name ''star cloud'' has been given to such regions. It should be understood that every white dot in the picture represents a sun, probably on the average considerably brighter than our own sun and presumably at a higher temperature. The whole Milky Way represents the direction in which the stars of our stellar system are most thickly congregated.



THE GREAT SPIRAL NEBULA IN ANDROMEDA

THIS object, which is faintly visible to the naked eye, near the star Nu in the constellation Andromeda, is one of the most wonderful nebulæ known. Its spiral shape was not clearly recognized by those who have studied in telescopes during the last hundred or more years, but was at once apparent as soon as good photographs were secured. It is not a gaseous mass, but probably consists of millions of suns so distant from us that they cannot be separated. It is approaching us at a speed of 180 miles per second.



TOTAL ECLIPSE OF THE SUN ON MAY 28, 1900

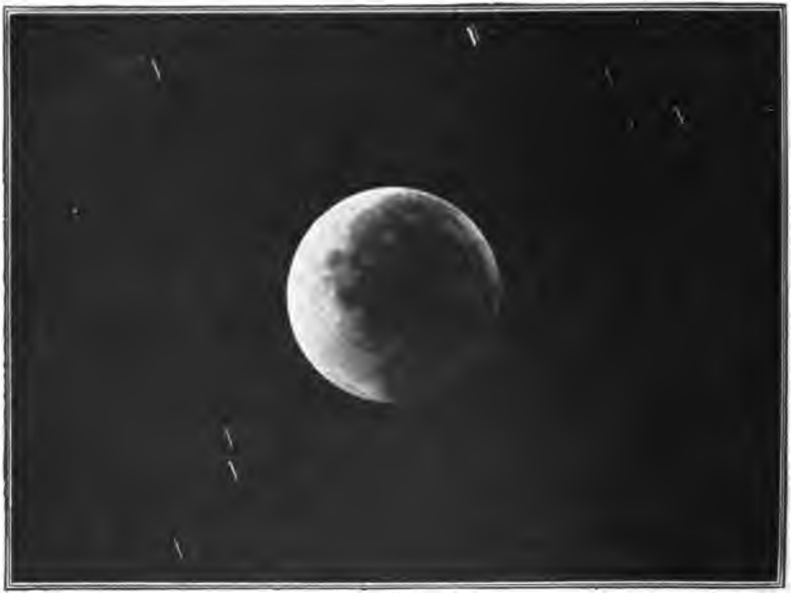
Photographed at Wadesboro, N. C., by E. E. Barnard and G. W. Ritchey, of the Yerkes Observatory

A TOTAL solar eclipse is caused by the passage of the moon exactly across the sun as seen from some place on the earth. It can happen only at the precise time of full moon. The moon and sun happen to appear of the same size to us. This is because the sun, though actually 400 times as large as the moon, is also nearly 400 times as far away. Hence the moon may completely cover the sun for a few minutes if its path at that full moon carries it across the center of the sun. Then a total solar eclipse will be visible over a narrow belt of the earth. In each year there will be two full moons (about six months apart), when solar eclipses must occur, but not necessarily total solar eclipses. At any one place a total eclipse will not occur on the average oftener than once in 360 years.

The duration of totality (when the sun's disk is wholly covered by the moon) can never exceed eight minutes, and usually is two or three minutes. During this time darkness comes over the observer, and around the black moon may be seen the beautiful solar corona, as shown in the photograph of the eclipse of May 28, 1900. This is a pearly glow around the sun, a sort of outer atmosphere of the sun, partly made up of a gas, called coronium, not yet found on the earth. Scarlet eruptions of hydrogen gas may then be seen around the edge of the sun, occasionally at great heights.

ECLIPSES OF THE MOON

WHEN the moon in its monthly trip around the earth reaches the point opposite the sun, we have full moon; and if the three bodies are just in line, there will be an eclipse of the moon. The earth will cut off the direct light of the sun for an hour or more; or, in other words, the moon will pass into the long, conical shadow of the earth. The earth's atmosphere, however, bends the grazing rays of sunlight inward and thus gives the moon a feeble, copper-colored light, instead of having it disappear entirely. Total eclipses of the moon are, for the whole earth, slightly less frequent than total eclipses of the sun, but when one does occur it is usually visible over more than half the earth. Hence at any one place a lunar eclipse will be seen every few years. In the picture here the sunlight refracted by the earth's atmosphere is sufficient to show many of the lunar features. The short white streaks are images of the stars, drawn out into streaks by the motion of the moon during the nine minutes while the picture was exposed.



Eclipse of the Moon

A Description of the Constellations and the Use of the Charts

THE stars have been divided into 80 groups or "constellations", of which about 54 are visible in the United States. The following have been omitted from these charts on account of the faintness of the stars involved and the less importance of the regions covered: Equuleus, Lacerta, Scutum Sobieski, Sextans and Vulpecula.

At any one time there are only about 2,500 stars visible to the naked eye, and in the whole sky, half of which is visible at one time, between 5,000 and 6,000 can be seen. Long ago these stars were divided into six classes or "magnitudes" from the brightest to the faintest. With each of the accompanying charts a scale of magnitudes is given below, from which the magnitude of a star may be found. Two important lines, the Equator (which is an extension of the earth's equator into the sky), and the Ecliptic (which is an extension of the earth's orbit into the sky), are given on each chart. The two points where these lines cross each other are called the vernal equinox and autumnal equinox. Twelve constellations, probably the first to be assigned names, are found along the ecliptic, forming the Zodiac, and in them will always be found the Sun, Moon, and Planets. Comets and meteors, however, may appear in any part of the sky. On account of the earth's rotation about its axis and its revolution about the sun, the constellations are continually shifting their positions with reference to the sun. For this reason four maps are given, for the time of evening and the date named in the table below each chart.

Generally speaking, the stars rise about an hour earlier every two weeks, so that a chart which represents the sky at 9:00 P. M. on one night will represent it at 8:00 P. M. two weeks later, and at 7:00 P. M. a month later.

To find the constellations, select the proper chart according to the month found at the top of the page, and the hour in the table below, and hold the chart over the head with the Northern Horizon north, etc. The stars then appear in the chart as they do in the sky. If one is looking for the northern constellations it will be found to be convenient simply to hold the chart with the "Northern Horizon" on the chart down, and if looking for western constellations to hold the chart with the "Western Horizon" down, etc.

The brightest stars have individual names, as will be found from the charts. Since early times the stars in each constellation have been known by Greek letters, in order of magnitude, the brightest star of the constellation being α (alpha), the next brightest β (beta), etc. A list of these Greek letters with their pronunciations will be found in any good dictionary. When a star is designated by its Greek letter, the name is given the genitive form in Latin. Thus Regulus is Alpha *Leonis,* and *Pollux* is Beta *Geminorum.*

Probably the beginner will find it easiest to first locate Ursa Major (the Big Dipper) and from α and β, which point to the pole star (Alpha *Ursae Minoris* or *Polaris*), *Ursa Minor* may be found. In this way the rest of the constellations may be identified from their relative positions. The brighter stars will be an aid to the identification of constellations. Of these, *Sirius* (the brightest star of the sky), *Vega, Procyon, Rigel, Altair, Spica, Regulus* and *Fomalhaut* are white; *Capella, Arcturus* and *Castor* are yellow; *Antares, Aldebaran* and *Betelgeux* are red.

Ursa Major, Scorpio, Orion, Aquila, Cassiopeia, Auriga, Leo and *Aquila* will be found to be comparatively easy to identify, and may be used as steps from which others may be found.

Interesting Objects

For any one possessing a telescope of two or three inches aperture the following list of objects will be well worth observation. They are classified according to the chart on which they appear.

For February, March and April

Double stars: Zeta *Ursae Majoris,* together with its fainter companion forms a naked-eye double (*Mizar* and *Alcor*) of which the brighter component is itself double, consisting of two nearly equal components 14″ apart. Any small spy glass will reveal these components of this star. *Castor* is also a very interesting double star of 6″ separation.

Nebulae: A hazy patch will be seen in the three faint stars just below the belt of Orion. This is the great Nebula, a wonderful chaotic mass of gas, in turbulent motion. A small telescope will bring out many of its details.

Star Clusters: About one-third the way between the sword handle in *Perseus* and δ *Cassiopeiae* lies the brilliant double cluster, plainly visible to the naked eye and a fine object for a small telescope.

Variable Stars: *Algol* (Beta *Persei*) is a fine example of the variable stars. It varies in magnitude between 1 and 2.5 with a period of 2.7 days. These variations in light are due to a dark companion circulating about it eclipsing it at each return.

For May, June and July

Double Stars: Epsilon *Lyrae,* just northeast of *Vega,* is a faint close naked-eye double star, requiring good vision to separate the components. In a small telescope each of these will be found to be itself a double star. Their distances apart are 3″ and 2″.6. Gamma *Virginis* is also an interesting double star.

Nebulae: The famous Ring Nebula in *Lyra* lies midway between Beta and Gamma *Lyrae*. A small telescope shows it nicely.

Star Clusters: Probably the finest cluster for the telescope lies one-third the way from Eta to Zeta *Herculis*. (Photograph and description will be found on page 48.)

Variable Stars: Beta *Lyrae* is a variable star which, like *Algol*, varies in magnitude between 2 and 2.8 over a period of about 13 days. Its changes also are due to mutual eclipses by the two companions.

For August, September and October

Double Stars: Gamma *Andromedae*, a yellow star with a green companion at a distance of 10″. With a telescope of 5 or 6 inches aperture the green companion will be found to be itself a double, of about 0.″6 separation.

Nebulae: and Star Clusters: The ring nebula in *Lyra* and the star clusters in *Perseus* and *Hercules* are in good position for observation.

Variable Stars: Delta *Cephei* is a variable star about the cause of the variations of which there is at present much discussion. It varies from the 3.8 magnitude to 4.7 magnitude in about 5 days.

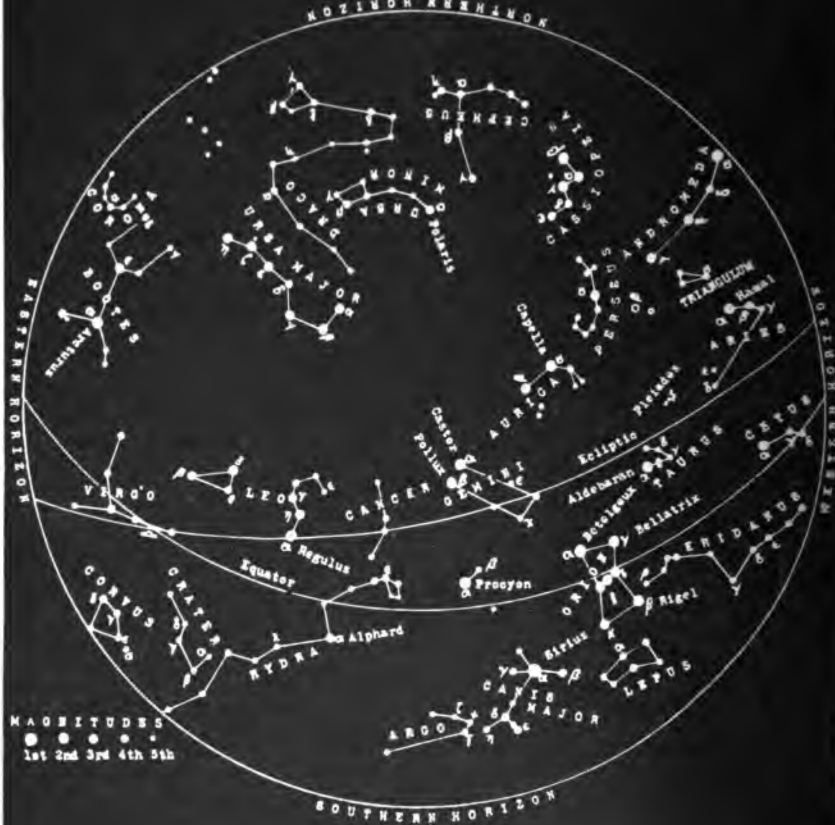
For November, December and January

Double Stars: Gamma *Andromedae* and *Castor* are in good position. *Rigel* will be found to be a double star having a faint companion at a distance of 9″.

Nebulae: The Great Nebula of *Andromeda* will be found about 8° west of Beta *Andromedae*. It is visible to the naked eye. A description and photograph are given on page 50. The great Nebula in *Orion* is also visible in the southeast.

Variable Stars: *Mira* (Omicron *Ceti*) is an irregularly variable star of period 331 days. Its magnitude varies from about 4.5 to below the 9th. It is quite irregular in both period and the amount of variation in light. *Algol* and Delta *Cephei* are also in good position. These stars are well worth observation with small telescopes. Any observatory will be glad to give information to observers of these objects.

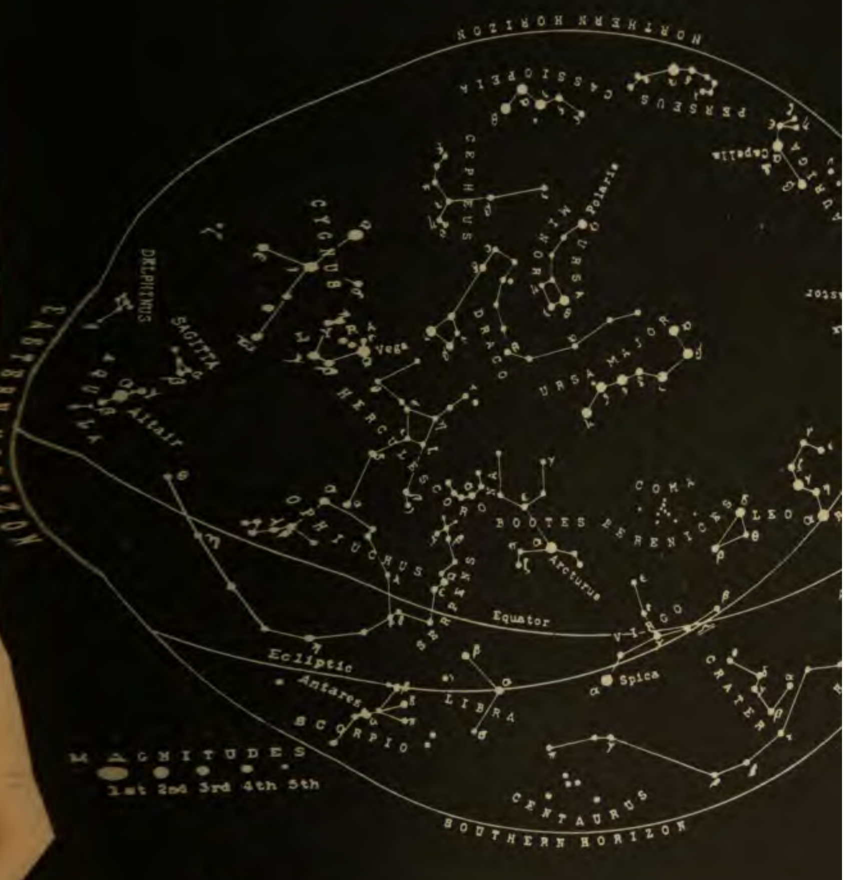
Constellations in the Spring Sky
February, March, April



Month	1st	15th
February	12 Midn.	11 P. M.
March	10 P. M.	9 P. M.
April	8 P. M.	7 P. M.

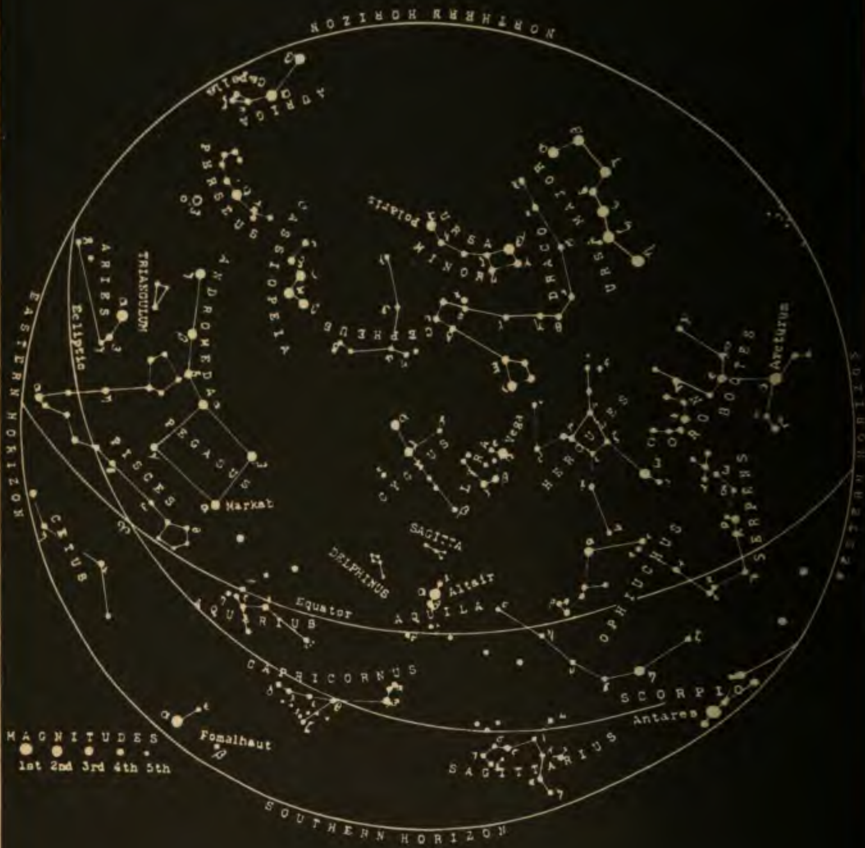
Constellations in the Summer

May, June, July



Month	1st	
May	12 Midn.	11
June	10 P. M.	9
July	8 P. M.	

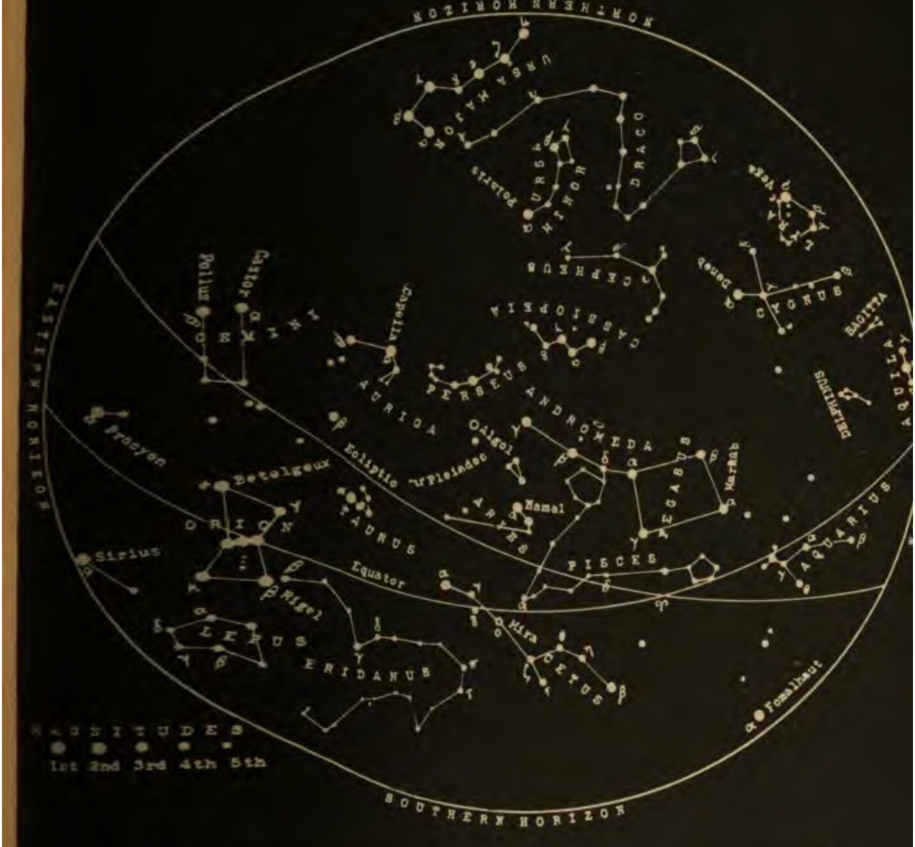
Constellations in the Autumn Sky
August, September, October



Month	1st	15th
August	12 Midn.	11 P. M.
September	10 P. M.	9 P. M.
October	8 P. M.	7 P. M.
November	6 P. M.	5 P. M.

Constellations in the Winter Sky

November, December, January



Month	1st	15th
November	12 Midn.	11 P. M.
December	10 P. M.	9 P. M.
January	8 P. M.	7 P. M.
February	6 P. M.	5 P. M.

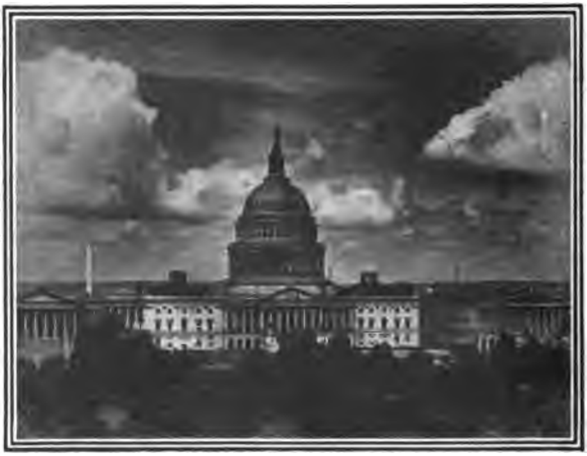
FORECASTING the WEATHER

by Prof. Henry J. Cox

of the U.S. Weather Bureau

FROM an early period in the history of the world an effort has been made to foretell the weather. The variations in the weather were first associated with certain appearances of heavenly bodies, and the task of forecasting was given to the astronomer, until Copernicus, in the sixteenth century, solved the problem of the solar system. Later, astrologers entered the field, but the quackery of their work was established before the end of the seventeenth century, and about that time the science of meteorology had its birth, following the invention of the thermometer by Galileo and that of the barometer by Torricelli. One by one the various countries have established official weather services and forecasts with more or less definiteness have since been made.

Today predictions are now being made for the various States of this country by the Weather Bureau forecasters for periods of thirty-six to forty-eight hours in advance with an average percentage of about eighty-eight; and predictions for longer periods under



Picture Taken in Washington, D. C., in Summer Time. Low Cumulus Clouds with High Cirrus in Background. Rain Type.

special conditions, but never more than a week in advance. True, the old almanacs contained forecasts for an entire year, but the authors of these publications had more regard for quantity than quality. In looking down the pages of these almanacs one is-struck with the constant repetition of the sentence, "About this time look out for rain."

There is some ground for the belief that there are cycles in the weather, but the basis of cycles has never been established and the rotation often ceases abruptly and disappears without any apparent cause.

Moreover, the theory of averages cannot be relied upon. As far as known, Napoleon was first to endeavor to make use of the knowledge of average conditions. It was early in the nineteenth century, when he was planning his famous march through Russia, that he called upon LaPlace, the astronomer and physicist, to calculate when the cold was likely to set in severely along the line of march. The latter found that on an average it did not occur until January. The Emperor made his plans accordingly, but a sharp spell of cold came in November and December, and the army which had started out with so much promise was lost before it could return. Only a small remnant of the original six hundred thousand men ever got back to France.

Fake Forecasters

There are several alleged forecasters in different parts of the country who issue predictions for a season and even a year in advance, but these have absolutely no basis. The authors are charlatans, and their status with reference to the science of Meteorology is similar to that of the quack doctors in the field of medicine. They simply parcel out the various kinds of weather in patches, putting first, for instance, a warm wave, then a little rain, later a cold wave for a few days with snow, then a blizzard, the usual January thaw, and finally a reasonable amount of fair weather. The order of these conditions could be reversed and the forecast for January and February be transposed without lowering in the least the percentages of verification. In fact, a reversal of periods will often result in improvement. The quack forecasters endeavor to hoodwink the people under the guise of "planetary meteorology," but they might just as well tell us that they feel of the goosebone or consult the groundhog. They pretend to place much dependence upon the mysterious movements of the mythical Vulcan, although scientists unanimously agree that there is no such heavenly body.

Forecasts of these fakirs are no more dependable than those who base predictions upon the actions and movements of animals. You might just as well trust in the following:

If the cock molt before the hen
We shall have weather thick and thin;
If the hen molt before the cock
We shall have weather hard as a block.

Birds, like animals, respond to present rather than future weather conditions. Birds of passage begin their southern migration with the first low temperature of autumn and out-travel the southward advance of winter; and they begin their northern journey when spring temperatures set in at their winter quarters. That their flights are sometimes premature is apparent to close observers. The faculty possessed by animals to interpret the signs of coming weather changes is limited to an instinctive appreciation of present atmospheric conditions, which are indicative of certain weather changes for periods of probably one to twelve hours in advance. It is evident upon consideration that the physical condition of animals and thickness of the coat of fur-bearing animals depend upon the weather of the past and the extent to which it has affected their food supply and general health, rather than upon the weather of the future. And the line of reasoning also applies to plants which are made the subject of future weather sayings. Neither has the moon nor any planet or conjunction of planets any effect upon the weather. The belief regarding the influence of the moon upon the weather—that a certain kind of moon is a "wet moon" and another a "dry moon"—is without foundation; as, for instance, that the moon, when new, "holds water" or "tips out water." From a weather standpoint, a really wet moon is one with either a halo or a corona, because both show condensation in the upper atmosphere; one at the altitude of the highest clouds and the other at intermediate levels. A pronounced halo or ring around the sun means just the same as a halo around the moon, and it is usually an indication of a storm within twenty-four hours.

About Weather Proverbs

Certain weather proverbs based upon the kind of clouds and the changes in barometer and wind have some foundation, as they are due to the observations of men who have naturally become weatherwise through the character of their occupations—farmers, sailors and the like. But no predictions from local indications can safely be made for more than a day in advance. Predictions based upon the weather at some previous time or at the present time, such as "If it rains on St. Swithin's Day (July 15), it will rain forty days thereafter," or "As the wind is on the equinox, so will it be for three months thereafter," should be given no credence, as they are not based upon any scientific principle.

Description of Storm Movement

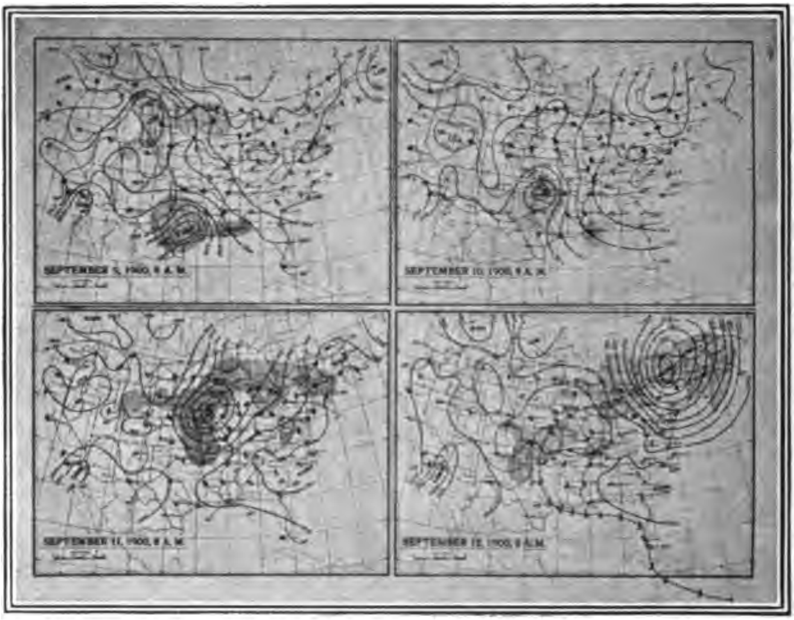
Storms are great eddies in the general circulation of the atmosphere, ranging from 500 to 2,000 miles in diameter, and they are carried along with the prevailing winds. Most of the storms that affect weather conditions in the United States enter the country on the North Pacific coast from Alaska in winter, and the district immediately east of the Rocky Mountains from the Canadian Northwest in summer. Some develop over the Great Basin in the far West; others in the Gulf States, and quite a number particularly in summer over the Central States. And then there are the tropical storms which form in the Caribbean in the late summer and fall.

Alto-Cumulus Clouds in Wave Form. Fair Weather Type

In the summer time the great majority of storms first appear in the Canadian Northwest, and in that season, in their movement eastward across the country, they pursue, on the average, a more northerly course than those of winter, and have less energy and slower movement—25 miles an hour as compared with 38 miles in winter. North of the 30th parallel storms move on the average south of east in the western portion of the country and north of east in the eastern and central portions.

The Galveston Hurricane

In the tropics storm movement is usually toward the west and northwest, because the preponderance of wind movement there is from the east, the storms later recurving to the northeast by the


SEPTEMBER 9, 1900, 8 A. M.
SEPTEMBER 10, 1900, 8 A. M.
SEPTEMBER 11, 1900, 8 A. M.
SEPTEMBER 12, 1900, 8 A.M.

Weather Maps Showing Track of Galveston Hurricane in September, 1900

time the 30th parallel is reached. The hurricane which wrecked the city of Galveston, September 8-9th, 1900, is a striking example of such a storm. The heavy broken line on the map of September 12 shows the track of the storm from the time it appeared south of Porto Rico on September 1. These storms, while in the tropics, move very slowly, and their diameter is small, 100 to 300 miles, and they generally lose force immediately after striking the coast. But the Galveston hurricane, although losing energy upon passing inland, redeveloped later as it reached the Great Lakes region, the wind velocities there again attaining hurricane force.

Description of Weather Maps

The maps in the illustration show the position of the storm and the general weather conditions on the mornings of September 9, 10, 11 and 12, 1900. Mark the word "low" on each map as the point of lowest barometer and the storm center. It is directly north of the Texas coast on the 9th, in Oklahoma on the 10th, Iowa on the 11th and the St. Lawrence valley on the 12th.

A Moonlight Scene Near Bermuda. Winter Cumulus. Fair Weather Type

The heavy lines on the map are the isobars, that is, lines of equal barometric pressure, while the dotted lines are the isotherms, lines of equal temperature. The dark shading limits the rainfall area accompanying the storm in each 24-hour period.

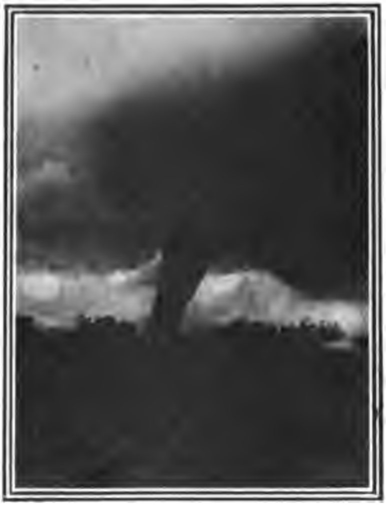
The word "high" marks the center of the highest atmospheric pressure, and this is usually an area of low temperature. In the winter time these highs with their attendant cold waves move from the Canadian Northwest in a southeasterly direction over the States, finally reaching the Atlantic coast with more or less severity.

The wind direction is shown at the various stations on the weather maps, the arrow flying with the wind. The winds blow spirally inward, counterclockwise, toward and around the center of the low, while from the center of the high they blow spirally outward in a direction similar to that described by the hands of a clock.

The following indications of the character of approaching changes are afforded by local observations of the wind and the barometer:

When the wind sets in from points between south and southeast and the barometer falls steadily, a storm is approaching from the west or northwest, and its center will pass near or to the north of the observer within twelve to twenty-four hours, with winds shifting to northwest by way of southwest and west. When the wind sets in from points between east and northeast and the barometer falls steadily, a storm is approaching from the south or southwest, and its center will pass near or to the south of the observer within twelve to twenty-four hours, with winds shifting to northwest by way of north. The rapidity of the storm's approach and its intensity will be indicated by the rate and the amount of the fall in the barometer.

There is more or less regularity in the sequence of highs and lows. Lows are usually preceded by rising temperature and accompanied by cloudiness and rain or snow; while the highs are usually preceded by falling temperature and attended by fair weather. By bearing in mind the usual movements of lows and highs and the conditions that accompany them, coming weather changes may be



Tornado, Solomon, Kan., May 22, 1903

foretold from the weather charts. Of course, the question of topography and the location of land and water areas with regard to the place for which the prediction is made are most important factors, and the individual of limited experience should not expect to make altogether satisfactory forecasts without considering these and other important influences.

Tornadoes

Associated with these larger storms are secondary storms, tornadoes and thunderstorms, that form in the southeastern quadrant of the former. The influence of tornadoes is felt only over limited areas, but the attendant high wind velocities make them very destructive and, as a consequence, greatly dreaded.

In the illustration of a tornado is a funnel-shaped cloud observed at Solomon, Kan., May 22, 1903. The funnel is well defined and probably the best photograph of a tornado ever taken in this country. Several houses were wrecked by the storm, but the damage to property was not great because the tornado passed over a sparsely settled region. These storms, while secondary whirls in the southeastern quadrant of a general storm center, move in a northeasterly or easterly direction parallel to the progressive movement of the main disturbance. Tornadoes usually have a track not more than half a mile wide and often less than a quarter of a mile, and only 8 or 10 miles in length. They have such a tremendous gyratory movement that there is a partial vacuum in the center which is, in a measure, largely responsible for the great damage wrought, closed buildings often exploding under the decreased pressure in the central core. No instrument has ever measured the velocity of the wind within a tornado, but it is probable that it reaches a force of from 200 to 300 miles an hour.

Official Weather Bureau Forecasts

The official forecasts of the United States Weather Bureau are based upon observations made twice daily, at 8 a. m. and 8 p. m., 75th meridian time, at various stations in this country and Canada, which are sent by telegraph to the central forecast points. The forecasts embrace the ordinary weather and temperature predictions and, in addition, when necessary, warnings of storms dangerous to navigation and transportation, gales, heavy snows, cold waves, frosts and the like; and all are given wide dissemination by telegraph and through the press and by weather maps, bulletins and forecast cards.

The predictions are usually limited to two days in advance, but special forecasts for a week are made at the central office of the Weather Bureau at Washington each Saturday; and during critical conditions or for special occasions forecasts for several days to a week are made by officials in charge of forecast centers outside of Washington. These are made frequently during the winter with reference to temperature conditions, especially in connection with the shipment of perishable goods; and forecasts are also made for a considerable period in the summer during haying and harvesting and in the interests of State fairs, street fairs and other outdoor enterprises. In these forecasts of longer range, the weather reports from Alaska and the islands of the Pacific are employed. Weather changes in Alaska may appear in two to three days in the Canadian Northwest and three or four days later in the Eastern States.

The Beaufort Wind Scale

There are different scales employed to designate wind force, but the Beaufort scale is the one in more general use and officially recognized by the United States Weather Bureau. The table follows:

Force	Designation	Miles per hour
0	Calm	From 0 to 3
1	Light air	Over 3 to 8
2	Light breeze	Over 8 to 13
3	Gentle breeze	Over 13 to 18
4	Moderate breeze	Over 18 to 23
5	Fresh breeze	Over 23 to 28
6	Strong breeze	Over 28 to 34
7	Moderate gale	Over 34 to 40
8	Fresh gale	Over 40 to 48
9	Strong gale	Over 48 to 56
10	Whole gale	Over 56 to 65
11	Storm	Over 65 to 75
12	Hurricane	Over 75

Wind Pressure

(Pounds per Square Foot)

The wind force in published figures is usually given in terms of miles per hour. These may be reduced to pounds per square foot by the use of the following table. The velocities are only given here for every 10 miles, but the necessary interpolations can readily be made.

Miles per hour	Lbs. per sq. ft.	Miles per hour	Lbs. per sq. ft.
10	0.3	60	10.8
20	1.2	70	14.7
30	2.7	80	19.2
40	4.8	90	24.3
50	7.5	100	30.0

THE LIBERTY BONDS

First Liberty Loan 3½'s—Dated June 15, 1917. Due June 15, 1947. Interest payable June 15 and December 15. Callable on and after June 15, 1932.

Second Liberty Loan 4's—Dated Nov. 15, 1917. Due Nov. 15, 1942. Interest payable May 15 and Nov. 15. Callable on and after Nov. 15, 1927.

Third Liberty Loan 4¼'s—Dated May 9, 1918. Due Sept. 15, 1928. Interest payable March 15 and Sept. 15. Not callable.

Fourth Liberty Loan 4¼'s—Dated October 24, 1918. Due Oct. 15, 1938. Interest payable April 15 and Oct. 15. Callable on and after Oct. 15, 1933.

Victory Liberty Loan 3¾'s and 4¾'s—Dated May 20, 1919. Due May 20, 1923. Interest payable June 15 and Dec. 15. Callable on June 15, 1922, or on Dec. 15, 1922.

First Converted 4's—Dated Nov. 15, 1917. Due June 15, 1947. Interest payable June 15 and Dec. 15. Callable on and after June 15, 1932.

First Converted 4¼'s—Dated May 9, 1918. Due June 15, 1947. Interest payable June 15 and Dec. 15. Callable on and after June 15, 1932.

Second Converted 4¼'s (of 1942)—Dated May 9, 1918. Due Nov. 15, 1942. Interest payable May 15 and Dec. 15. Callable on and after Nov. 15, 1927.

Second Converted 4¼'s (of 1947)—Dated Oct. 24, 1918. Due June 15, 1947. Interest payable June 15 and Dec. 15. Callable on and after June 15, 1932.

All issues are permanently exempt, both principal and interest, from all State and local taxes (except inheritance taxes), and from the normal Federal income tax.

WHERE OUR CARDS COME FROM

Playing cards were invented about the year 1390 in order to amuse Charles VI, then King of France, who was subject to fits of melancholy. The inventor undertook to make them representative of the four classes of men among the King's subjects.

The clergy were represented by hearts, but the Spanish—who took the cards from the French—considered a copa or chalice more appropriate, and substituted such design for the heart. The nobility and military were represented by the points of spears, which subsequently were misnamed "spades."

Diamonds stood for citizens, merchants and tradespeople, not because of their association with precious stones, but because of the cerreaux, the red marks that appear upon the cards, intended to represent the stone tiles of which the houses of the middle classes were built.

The figure we call a "club" was originally a clover leaf, and alluded to peasants and farmers. Spanish cards bear a stave or basto in lieu of the French clover leaf, and it probably is because of this that we refer to the suit as "clubs."

BIRDS THROUGH THE YEAR

by Samuel A. Harper

Author of "Twelve Months With the Birds and Poets," etc.

> "Cuckoo calling from the hill,
> Swallow skimming by the mill,
> Mark the seasons, map our year,
> As they show and disappear."
> —Matthew Arnold.

MOST North American birds are migratory, traveling south in autumn in search of feeding grounds for the winter, and north in the spring, in search of suitable nesting areas. Any bird calendar for the United States, therefore, must be based upon observations made at a particular parallel of latitude, and the following discussion of some of our more common birds, classified by seasons, is based upon observations made at about latitude 42°, or Northern Indiana and Illinois.

ARCTIC TERN
The World's Migration Champion

Migration of Birds

In the study of birds of any given territory it is very helpful to the student to know not only where but when to look for a particular species, and a bird calendar is quite as essential for the student of ornithology as weather maps for the student of meteorology. A few birds like the quail, cardinal, grouse and Carolina wren are non-migratory. They remain in the same latitude throughout the entire year, and often spend the full period of their existence within an area of a very few square miles. Such birds being permanent residents, their actions have little or no reference to the calendar, and they may therefore be looked for in their native haunts at any season of the year. The migratory birds travel twice a year distances varying all the way from two or three hundred to eleven thousand miles, so that it is obvious that while at certain periods during the spring or autumn migration certain species may be common to a certain locality, they may neither be looked for nor expected at any other season.

Why Birds Migrate

Contrary to the popular impression and the early opinions of students of migration, temperature has but little influence upon the migratory habits of the birds. Food supply is undoubtedly the most controlling consideration. Those birds whose favorite food can readily be obtained in winter, uninterrupted by snow or other weather conditions, are usually permanent residents, and do not migrate southward in autumn. Birds have wonderful breathing capacity, and hence great animal heat, and seldom are seriously affected by cold weather alone. Tiny chickadees, creepers and nuthatches seem less inconvenienced by the cold, sharp air of winter than we do. The food of many birds is quite inaccessible in winter, however, and the ever-present and controlling impulse of self-preservation unfailingly directs them to their food supply. But, given an abundance of its favorite food, a bird's movements no longer seem to be governed by the calendar. Red-headed woodpeckers, for example, were supposed to migrate southward in the fall and pass the winter south of Maryland, until Dr. Merriam, in his interesting account of the habits of this species, tells that in one county in New York their abundance in winter was in no way affected by the severity of the weather, but was entirely dependent upon the success of the crop of beechnuts, which constituted their food.

BIRD CALENDAR

The following bird calendar, for latitude 42°, includes a fairly complete list of the more common birds, classified according to the seasons, and the birds listed may be looked for in this latitude during the season in which they are named:

PERMANENT RESIDENTS—All Seasons

Barred owl
Great horned owl
Screech owl
Hairy woodpecker
Downy woodpecker
Prairie horned lark
Blue jay
American goldfinch
Cardinal
White-breasted nuthatch
Tufted titmouse
Chickadee
Puffed grouse
Quail

SUMMER RESIDENTS—April to October

Robin
Bluebird
Wood thrush
House wren
Long-billed marsh wren
Short-billed marsh wren
Brown thrasher
Catbird
Redstart
Yellowthroat
Yellow warbler
Warbling vireo
Red-eyed vireo
Migrant shrike
Cedar waxwing
Red-winged blackbird
Meadowlark
Baltimore oriole
Crow blackbird
Chipping sparrow
Field sparrow
Song sparrow
Swamp sparrow
Towhee
Rose-breasted grosbeak
Indigo bunting
Dickcissel
Scarlet tanager
Purple martin
Cliff swallow
Barn swallow
Bank swallow
Cowbird
Bobolink
Wood pewee
Phœbe
Kingbird
Hummingbird
Chimney swift
Nighthawk
Whippoorwill
Red-headed woodpecker (sometimes in winter)
Flicker (sometimes in winter)
Yellow-billed cuckoo
Black-billed cuckoo
Red-tailed hawk
Red-shouldered hawk
Broad-winged hawk
Cooper hawk
Sparrow hawk
Mourning dove
Prairie hen
Killdeer
Spotted sandpiper
Bartramian sandpiper
Jack snipe
Woodcock
Coot
Florida gallinule
Rail
Black-crowned night heron
Green heron
Great blue heron
Bittern

SPRING AND AUTUMN MIGRANTS—February to May and August to November

Hermit thrush
Olive-backed thrush
Gray-checked thrush
Veery
Blue-gray gnatcatcher
Kinglet
Red-breasted nuthatch
Brown creeper (sometimes in winter)
Winter wren
Warblers
Yellow-throated vireo
Blue-headed vireo
Tree swallow
Juneo (sometimes in winter)
Fox sparrow (sometimes in winter)
White-throated sparrow
White-crowned sparrow
Rusty blackbird
Crested flycatcher
Red-bellied woodpecker
Yellow-bellied sapsucker
Sharp-shinned hawk
Pectoral sandpiper
Red-backed sandpiper
Semi-palmated sandpiper
Solitary sandpiper
Yellowlegs
Golden plover
Semi-palmated plover

WINTER RESIDENTS—October to March

Herring gull
Ring-billed gull
American goshawk
Rough-legged hawk
Evening grosbeak
Purple finch
Redpoll
Lapland longspur
Northern shrike
Tree sparrow
Snowflake

The general classification of birds given for the respective seasons will be found reasonably accurate for this latitude anywhere in the United States, between the Rocky Mountains and the Atlantic seaboard.

Many interesting facts have been established with reference to the regular semi-annual migration of many of the birds, but how they are able successfully to traverse such great distances, often oversea for many hundreds of miles, and return to the same area season after season, is one of nature's riddles.

Many influences, however, have a more or less important bearing upon the migration of the birds, among which may be mentioned coast lines, river channels, food supply, sex impulses, hunger, love, homing instinct, inherited or acquired memory, temperature, storm conditions, magnetic meridians, etc., all of which are good as far as they go, but none of them, nor all of them together, can wholly account for the phenomenon.

The ancients observed that some birds visited them only for short periods and at certain seasons, but they apparently sought or found no explanation for it, and some thought that the birds hibernated, after the manner of certain animals who thus survive the period when the food supply is entirely cut off.

While flying is not the only way in which animals migrate, it is the most effective, and birds are structurally well provided with the means of escaping from the disastrous effects of adverse circumstances, and in this way nature has wisely provided against the necessity for hibernation.

The fact that the birds are endowed with the power of flight suggests some things which doubtless have had an influence upon the cause or origin of migration. For example, this power enables the birds to avoid many of their natural enemies, and also to move rapidly from one feeding-ground to another. They have therefore naturally traveled away from those things which were disadvantageous to them, and sought conditions that were more favorable. In the same manner they formed habits of wandering in search of food. In their wanderings, which gradually have been extended over wider and wider areas, they have discovered attractive feeding-grounds and suitable nesting-places; and when to this are added the other recognized influences, the cause of or reason for migration is about as fully explained as it ever will be.

Certain it is that as our northern spring approaches, the sex impulse, the strongest of all animal impulses, upon which reproduction and the very existence of the species depend, overcomes all other desires, and the bird grows restless and, guided by the hereditary instincts mentioned, it seeks its breeding-area.

Heights That Birds Attain During Migration

Some very interesting facts have been definitely ascertained with reference to the height that birds attain during migration, and the speed and distances traveled. Birds, in migrating, often ascend to great heights, for which two principal reasons have been assigned: first, that it increases the range of vision, and, second, that they thereby reach a zone or stratum of atmosphere in which flight may be more easy. In 1888 Dr. Frank M. Chapman published an account of certain observations made by him, in which he calculated that the birds traveled at heights varying from 600 to 15,000 feet. A number of the birds which he observed were seen flying upwards, crossing the moon, therefore, diagonally, "these evidently being birds which had arisen in our immediate neighborhood, and were seeking the proper elevation at which to continue

Canadian Wild Goose

their flight." Beginning their flight, birds have been observed flying upwards in an almost perpendicular direction, until they reached heights beyond the range of the natural vision. They usually rise to the greatest heights when starting upon oversea journeys.

Ducks and geese normally travel at about 40 to 50 miles per hour, but Prof. J. Stebbins and Mr. E. A. Fath made careful calculations from observations with a telescope, and found that birds passed at rates varying from 80 to 130 miles per hour. With favorable winds, even these rates of speed are sometimes greatly exceeded.

Long-Distance Flight of Birds

The distances traveled by the birds, some of them so tiny that one would think they would be wholly lost in the wide blue expanse of heaven, are very remarkable. The palm warbler, which is a common migrant, nests in Canada, 3,000 miles from Cuba, its winter home. It is a tiny bird, about five inches long, less than half the size of a robin. Similar long trips are made by many of the other warblers that are so small that the ordinary casual observer never sees them at all as they flit about in our treetops in May and September.

The American golden plover nests along the Arctic coast from Alaska to Hudson Bay, and winters in Argentina, in southern South America, 8,000 miles distant, and in the course of its migration to its winter home makes the longest single flight oversea journey of which we have any record. This flight is from the coast of Nova Scotia across the Atlantic southward to South America, a distance of 2,500 miles. These birds have magnificent powers of flight, and Mr. G. H. Mackay thinks, with reason, that in making this long oversea journey under favorable conditions they travel at a speed of from 150 to 200 miles per hour.

The Eastern or Pacific golden plover winters in certain islands of the Southern Pacific Ocean, including the Low Archipelago, which is 5,000 miles by direct air route, but about 11,000 miles by way of its migration route from Alaska, which is also the summer home of this species. These two golden plover, therefore, which are sub-specifically distinct, nest in Alaska little more than one hundred miles apart, and one travels east through Nova Scotia, and south 8,000 miles to South America, and the other travels southwest to Siberia and China, and then southeast to the islands of the Southern Pacific, a distance of about 11,000 miles. These two birds, very similar in general appearance, nesting in the same area, never fail to separate into two distinct migrating groups, one traveling southwest 11,000 miles, and the other southeast 8,000 miles, to winter homes as remote from each other as they could well be in two widely divergent species.

Our robin makes a leisurely 3,000-mile trip twice a year, taking about seventy-eight days for each trip.

Among our most common long-distance migrants may be mentioned the bobolink, which nests in this latitude and northward and winters in southern Brazil; the scarlet tanager, which migrates from Canada to Peru; purple martins, swallows and thrushes, which breed from this latitude northward and migrate to Central South America, and the nighthawks, which nest as far north as Yukon, and spend their winters in Argentina, 7,000 miles distant. Many species of shore birds breeding north of the Arctic circle visit South America over a migration route of about 8,000 miles.

The World's Migration Champion

The Arctic tern is called by the late Mr. Wells M. Cooke "the world's migration champion." These little birds nest as far north as land has been discovered, arriving there about June 15, where they remain until about August 25, when they leave for the south, and several months later they are found in large numbers skirting the edge of the Antarctic continent, 11,000 miles from the nesting-site. These birds thus cover a round-trip migration route of 22,000 miles every year with scarcely twenty weeks for the round trip. This means one hundred and fifty miles a day in a straight line, but this distance is no doubt actually doubled or trebled by these birds every day, by reason of their darting, irregular flight in search of food. Mr. Cooke calls attention to an interesting fact which results from the wonderful migration habits of this bird:

> "The Arctic tern has more hours of daylight and sunlight than any other animal on the globe. At the most northern nesting-site the midnight sun has already appeared before the birds' arrival, and it never sets during their entire stay at the breeding-grounds. During two months of their sojourn in the Antarctic the birds do not see a sunset, and for the rest of the time the sun

dips only a little way below the horizon, and broad daylight is continuous. The birds therefore have twenty-four hours of daylight for at least eight months in the year, and during the other four months have considerable more daylight than darkness.''

Most of the birds, when migrating, travel by night and feed by day. Many of the most interesting and reliable observations on record have been made at lighthouses, and elsewhere, by viewing with a telescope the face of the moon, across which the birds have been seen flying.

Many of our summer residents may be called half-migrating, for, while they usually migrate southward in the fall and return in the spring, they sometimes remain in the north during the winter, especially in neighborhoods where the requisite food may be had, thus proving again that food is the most controlling consideration in the migration of the birds. Among the common birds that sometimes spend the winters with us may be mentioned the robin, bluebird, meadow-lark, junco, kinglet, cardinal, nuthatch, woodpecker, chickadee, goldfinch, and certain of the sparrows. The casual observer seldom sees any of them in winter, but to eyes that see and hearts that listen they frequently bring a message of gladness into the dark days of winter.

The Homing Instinct of Birds

Birds seem to have an exaggerated or highly developed sense of direction. Most animals, especially those whose natural instincts have not been dulled by domestication, have this sense in more or less marked degree, but in the exercise of this faculty the birds unquestionably excel. While man cannot navigate the seas without the aid of chart and compass, birds released from a ship many miles at sea will invariably and unhesitatingly head their flight directly toward the nearest land. It is interesting in this connection to recall what an important part migrating birds had in the discovery of this continent by Columbus. When the great navigator and his men were almost at the point of abandoning the attempt to reach land, and about a week before they landed at San Salvador, great encouragement came to them from observing large numbers of birds migrating to the southwest, as they do now, near the Atlantic coast. When after a few days they became very abundant, Columbus changed his course and followed them, ultimately reaching the Bahamas. It follows that migratory birds were responsible for the fact that the great navigator first landed in the Bahama Islands rather than on the mainland of North America.

The homing instinct or sense of direction of birds has been clearly demonstrated by some remarkable experiments conducted by Prof. Watson of Johns Hopkins University. Many thousands of sooty and noddy terns nest on Bird Key, a small island in the Dry Tortugas. Prof. Watson took three or four of these birds first 20, then 60, then 108 and lastly over a thousand miles up the Atlantic coast, and again 850 miles directly across the Gulf of Mexico, where there could be no possible landmark to guide the birds' return, and in every instance, after a reasonable length of time, depending upon the distance traveled, the birds were found again occupying their nests at Bird Key.

Doubtless this sense of direction in aboriginal man was strong and perhaps as unerring as it is now with the birds, but in the course of many generations of culture man came to rely so much upon various mechanical devices and guides invented and designed for his aid, and so little upon instinct, that the latter ultimately became, as it were, atrophied from disuse.

Lighthouses Destructive to Birds

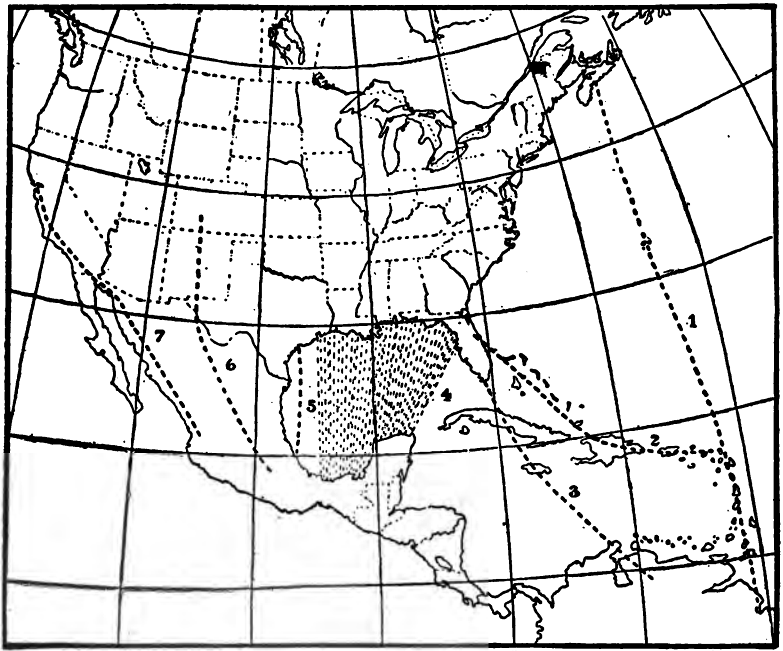
Now it unfortunately happens that thousands of birds during their migration are actually lured to their death by one of the very devices designed by man to assist him in avoiding the dangers incident to his travels. Lighthouses for some unknown reason seem to hold an almost irresistible attraction for birds migrating at night, and the brighter the light, the greater the attraction. Especially upon dark or stormy nights, during the migration season, the birds seem drawn to these lights as moths are attracted by a flame. After flying within the radius of the rays of such a light they appear to be blinded by it and, becoming confused, dash themselves to death against the structure which sustains it. Many interesting observations of this kind have been made by ornithologists at lighthouses, and such experiences are familiar to all keepers of such coast lights.

Thousands of birds have met death in this way at the Statue of Liberty Light, in New York harbor, and Dr. Chapman in referring to accidents of this kind to birds at Fire Island Light, Long Island, records the killing during one night of 356 black-poll warblers alone. Successful efforts have been made at some of these stations to install lights of a kind which will answer the purposes of navigation, without being so deadly to the migrating birds, and perches have also been erected around some of the lights in an effort to lure the birds away from the light to a place of rest and safety.

Migration itself, like the homing instinct or sense of direction, while not altogether peculiar to the birds, is more highly developed with them than with any other animals. Winter visitors to the Pacific coast may see sporting about, in the warmer California coast waters, seals which have migrated thence from the Bering Sea. Doubtless moved by the same primal surge which is felt by the birds in the spring, salmon, eels and shad during the same season travel up the streams to lay their eggs, and some deer in the extreme north migrate southward in winter. As with the birds, the two most compelling influences in inducing these migrations are the instinct for reproduction and the desire for food.

Migration Routes of Birds

The map given below shows the principal migration routes of North American birds.



Courtesy of U. S. Dept. of Agriculture

PRINCIPAL MIGRATION ROUTES OF NORTH AMERICA

Most migrants use route No. 4, though this necessitates a flight of 500 to 700 miles across the Gulf of Mexico. A few traverse the more direct route No. 3, and still fewer, route No. 2. Only water birds make the 2,400-mile flight along route No. 1, from Nova Scotia to South America.

The Chimney Swift

The chimney swift, one of the most interesting subjects for the student of birds, is popularly confused with the swallows, and is often miscalled chimney swallow, but the resemblance is only superficial, while the structural differences between the two are numerous and important. Structurally the swift is related to the hummingbirds and not to the swallows. It feeds entirely on the wing, and has never been seen perching anywhere except on the inside of a chimney or hollow tree. Except when nesting or roosting, therefore, it is constantly on the wing, even drinking and gathering dead twigs for its nest while flying. They skim over the surface of the water and dip their bills into it while on the wing. Tennyson speaks of the "skimming swallows," and Virgil wrote:

"The twittering swallow skims the dimpled lake."

They have been observed flying up to old, dead trees, catching at the ends of dead twigs, and carrying them off in their bills. Indeed their feet are so slender and frail they are unable to perch across a limb in the usual way, and they use them to cling to the side of the wall of the chimney after the manner of woodpeckers, using the tail as a support. Because of this habit, doubtless long continued, the shafts of the tail feathers extend beyond the vanes.

The swifts also leave about the middle of September, and the remarkable thing about it is that no one knows where they go. Their winter base is one of the unsolved mysteries of bird migration.

The late Mr. Wells W. Cooke, of the United States Biological Survey, perhaps the foremost American student of migration, could tell us no more about this riddle than the merest novice. He says:

> "Much has been learned about bird migration in these latter days, but much yet remains to be learned, and the following is one of the most curious and interesting of the unsolved problems. The chimney swift is one of the most abundant and best-known birds of eastern United States. With troops of fledglings catching their winged prey as they go and lodging by night in tall chimneys, the flocks drift slowly south, joining with other bands, until on the northern coast of the Gulf of Mexico they become an innumerable host. Then they disappear. Did they drop into the water or hibernate in the mud, as was believed of old, their obliteration could not be more complete. In the last week of March a joyful twittering far overhead announces their return to the Gulf coast, but their hiding place during the intervening five months is still the swift's secret."

However baffling the mystery of their winter home, the happy fact remains that they do return to us each spring, and we have the abiding confidence of Adelaide Anne Proctor that they always will:

"Where are the swallows fled?
Frozen and dead,
Perchance, upon some bleak and stormy shore.
O doubting heart!
Far over purple seas
They wait, in sunny ease,
The balmy southern breeze,
To bring them to their northern homes once more."

Economic Value of Birds

Reliable students of ornithology have estimated that except for the birds the noxious insects would destroy every bit of growing vegetation on the face of the earth within three years. This statement emphasizes in a very effective way the economic importance of our common birds and the necessity for their protection

Cooper's Hawk

This bird, in the estimation of the U. S. Biological Survey, leads the rogues' gallery of the "absolutely blacklisted."

Great Horned Owl

Blacklisted Birds Are Few

There are only a very few individual species of birds which do more harm than good. The only birds which the United States Biological Survey is willing to say are "absolutely blacklisted" are the Cooper hawk, sharp-shinned hawk, goshawk and the great horned owl.

Even those birds which, because of their general habits or the variety of food eaten, are not considered entitled to protection, are often highly beneficial in certain localities. Even as to the list of

American Goshawk

Sharp-Shinned Hawk

so-called condemned birds, therefore, the question as to whether they should be destroyed or protected is properly a local one. For example, it is shown that 36 per cent of the food of the unpopular English sparrows during the month of May in the Salt Lake Valley is alfalfa weevils, and about 19 per cent caterpillars, and that later in the season, from July 1st to the 15th, it is 35 per cent grasshoppers.

Mr. E. W. Nelson, Chief of the United States Bureau of Biological Survey, writes:

> "A number of birds are not protected by law over most of the United States, but at the same time it is hardly desirable to attempt exterminating them. Such species include the English sparrow, crows and blackbirds."

Hawks

There are 73 species and sub-species of hawks in America, and only six of these are injurious, yet in the popular mind every hawk that appears in the sky is a "chicken hawk," deserving death. Only two of these six are at all common in this latitude, the Cooper hawk and the sharp-shinned hawk. These *accipiters,* who do all the damage, are treacherous and stealthy like most villains, while the *buteos* (large, red-tailed and red-shouldered hawks), who are frequently blamed for all the crimes of the Cooper hawks and the sharp-shinned hawks, destroy no chickens. The *buteos* feed chiefly upon crop-destroying rodents. On the Western plains they are fond of prairie dogs. Some years ago the farmers and ranchmen, possessed of the common prejudice against these birds, killed large numbers of them, and the prairie dogs soon became so numerous as to be a very serious pest. At the request of these same farmers and ranchmen, the United States Biological Survey officials endeavored to find some means to abate the plague, and one of the first recommendations made was that the hawks be protected.

Crows

The common crow is another bird which is frequently misjudged by the farmer. The popular idea among farmers is that he eats up much of the newly planted seed corn, and he therefore gets blamed for all the empty hills in the corn field. As a matter of fact, a crow will seldom eat dry kernels of seed corn, and when feeding in the corn hills he is more often found destroying cutworms than eating the corn. The fact is that, being a very omnivorous bird, he by no means depends upon corn or other grain to gratify his appetite, but eats carrion, fish, birds' eggs and many injurious insects and worms.

Bird Conservation

Fortunately, the campaign of education which has been conducted in recent years by the United States Government, Audubon Societies, bird clubs and the public schools is showing very happy results in the matter of conservation of our bird life, and a decided change of sentiment in our people, both old and young, with reference to bird protection. The Federal migratory bird law, supplemented by the treaty with Canada, is a powerful instrument of bird conservation, and protects all our migratory song birds and prohibits spring shooting of game birds.

We all owe the birds much, and the least we can do for the joy they bring and the service they render is to protect them at all seasons and befriend those who favor us with their presence during the dreary wastes of winter.

An editor in Kankakee
  Once falling in a burning passion
With a vexatious rival, he
  Wrote him a letter in this fashion:
"You are an ass, uncouth and rude,
  And will be one eternally"—
Then, in an absent-minded mood,
  He signed it "Yours fraternally."

The GREATNESS of the UNITED STATES in COMMERCE INDUSTRY and RESOURCES

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LIFE among primitive people is a continuous struggle for the things absolutely essential to their life. With highly developed nations the struggle frequently becomes even more intense, because wants increase with civilization. Whether primitive or civilized people, their wants are supplied, directly or indirectly, out of the products of the earth; and the nation richest in these natural resources is the one most likely to have a prosperous and progressive people.

Hull-Rust Mine near Hibbing, Minn. This is the largest open-pit iron mine in the world. At this point the pit is ¾ of a mile in width. Length, 1¾ miles.

Nature, on the whole, is a very unequal distributor, and some nations have more, others less of these natural riches. However, it doesn't all depend upon the possession, for not all nations use their resources equally well. Mexico and Russia, for example, are very rich in resources, but fail to do much with them, and in consequence remain poor and unprogressive. Others, like spendthrift children, fritter away some or all of their great inheritance and sooner or later suffer for their folly. The United States, in part, belongs to this class. It was to check such tendencies that the "Conservation of Natural Resources" movement was started, and later so vigorously pushed by Roosevelt while President.

The Basis for Commerce

Although we may have what seems a superabundance of some resources, yet this is no excuse for extravagance or lack of conservation. This same resource may be or become the basis of a very vital exchange. The surplus of one country may be exchanged for the surplus of another to the mutual advantage of both; and thus we have the true basis for commerce. One of the oldest records of such exchanges is found in the Bible:

> "And Hiram sent to Solomon, saying, I have heard the message which thou hast sent me. I will do all thy desire concerning timber of cedar and concerning timber of fir. My servants shall bring them down from Lebanon unto the sea and I will make them into rafts to go by sea unto the place that thou shalt appoint me, and will cause them to be broken up there, and thou shalt receive them; and thou shalt accomplish my desire in giving food for my household. So Hiram gave Solomon timber of cedar and timber of fir according to all his desire. And Solomon gave Hiram twenty thousand measures of wheat for food to his household and twenty measures of pure oil. Thus gave Solomon to Hiram year by year. And the Lord gave Solomon wisdom as he promised him; and there was peace between Hiram and Solomon; and they two made a league together."—I Kings 8:11.

Gold as Medium of Exchange

In modern times, exchanges of commodities have become so complicated that a general medium of exchange is accepted by all nations. This medium is gold and is the only thing accepted in lieu of the commodity. It must be remembered that no nation can buy commodities indefinitely without having some commodity to give in exchange, gold in this sense also being a commodity. With a system of credits based on gold, we call it commerce; without a system of credits, like the above, we call it barter.

The study of the commerce of a country is instructive, for it shows many things. It is like seeing a person's bank deposit book and his checking account. The exports of a country tell, in the main, what the people produced more than they actually needed;

and in the same way, the imports tell what the people needed or wanted and didn't, or perhaps couldn't, produce. To have a big foreign commerce is not necessarily an advantage; but, in general, the bigness of the commerce determines the international importance of a nation.

The greatness of the United States, in a way, may be judged from the bigness of her foreign commerce. Even ten years ago no one in his wildest flights of imagination would have predicted that the commerce for 1920 would reach the staggering total of thirteen and a half billion dollars. This sum is about four and one-half times as much as that of all the South American countries and about five times that of the whole continent of Africa.

Since the beginning of the war, our trade totals not only have increased enormously, but also our exports have been much greater than our imports, thus laying up a large reserve. During the last five years we have sold about sixteen billion dollars more than we have bought. This, naturally, brought great prosperity, but such a state of affairs could not go on indefinitely. The time came when nations could no longer afford to buy much, and, what was more, could less afford to buy from us because of the high exchange rate. The business world began to realize soon that if our goods are to go to all parts of the world we must buy and thus help the people to pay for the goods imported from the United States. As soon as the rest of the world gets enough money to buy, then the United States will be prosperous, for it will have an outlet for its surplus products. It is merely another example that no nation can isolate itself from the rest of the world; that when any part of the world suffers, the rest suffers also. It is only after such enormous catastrophes as the one through which we have passed so recently that these facts are driven home to us.

Cotton Our Leading Item of Export

Our leading commodities of export for 1920, according to the latest available statistics, are raw products mainly. Cotton leads all commodities, with a total export of $1,136,400,000. This is by no means the total value of the crop, the United States being not only the greatest producer and the greatest exporter by far, but also the greatest consumer of raw cotton. The United States dominates the cotton situation of the world. On the other hand, since so large a part of our cotton crop is exported, the cotton-growing sections are the ones to suffer severely when the rest of the world has no money to buy.

Our next greatest export for the same period is breadstuffs.

Threshing Scene in St. Joseph County, Indiana

This reached the enormous sum of $1,074,300,000. In quantity this export was two and a half times as much as in 1914, the last prewar year, while its value was over six and a half times. The principal articles in this group were wheat, with over a half billion dollars' worth, and flour, in value almost a quarter billion dollars. Among the other major articles were rye, rice, barley, corn and oats.

The United States is the greatest wheat producer in the world. For a number of years we have produced over three-fourths of a billion bushels and in 1915 we produced our largest crop, the only year in which we have produced over a billion bushels. We do not export so large a percentage of our wheat as we do of our cotton crop. In recent years we have exported from a fifth to a third of our crop. The United States also may be considered the greatest exporter of wheat and wheat products, although in prewar years Russia sometimes exported more than this country.

Kansas is our leading wheat State, growing more than twice as much as her nearest competitor. Kansas also grows nearly twice as much as Australia, nearly as much as Argentina, and more than three-fourths that of Canada. She is more than a wheat State, for her total value of crops in 1920 was $699,170,000 and live stock, $283,259,000.

"Corn is King"

Of all the other cereals, corn is by far the most important to the American people. It is our most widely grown crop, occupying nearly one-fourth of the land under crops. No other cereal crop in this country or any other country equals it in quantity, and there is reason to believe that no other country ever can raise a crop to rival it in quantity. The quantity grown varies from two and a half to three billion bushels per year. As a typical American crop, it rightly deserves to be considered as "Corn is King" in American life.

Iowa is our leading corn State and far outranks the production of any foreign nation. In fact, the United States produces about three-fourths of the entire world crop.

Although our corn crop far outranks any other cereal in any other country, yet only about two per cent of it enters into international trade. Wheat is a money crop for the farmer, but corn is a feeder crop. The fattening of hogs and cattle is the chief use, and it has been estimated that four out of every five bushels never leave the community where grown. It is an easy guess what State or States have the largest representation at the International Live Stock Show at Chicago.

In general importance all other cereals are of minor consideration. Oats, with an annual production of over a billion bushels, exceeds wheat in the number of bushels, but is much less in value. Oats, like corn, does not enter heavily into international trade, but is used largely as an animal food. Being rich in protein, it is an excellent food for young growing animals, while corn, rich in oil, is the food that fattens. Barley, rye and rice loom large when compared with the production of most countries, but, as far as the United States is concerned, their value is distinctly minor.

Another of our great money crops is tobacco. Although tobacco is one, if not the most widely grown crop that enters largely into commerce, yet the United States produces fully one-third of the total world crop. This country is not only the largest producer, but also the greatest exporter, greatest consumer, as well as one of the great importers. The area devoted to the crop is small, but the average return per acre is large, running as high as $300 or $400 per acre. In tonnage the tobacco trade is a small item when compared with sugar, the fibers and the leading cereals; but the relatively high price per pound makes it compare favorably with many wares in total commercial value. In our own export list it stands seventh in 1920, with a total value of $245,000,000.

Importance of Petroleum Products

Our third greatest export in 1920 was mineral oil, the crude and refined products of petroleum. Except in the very early part of the petroleum industry, the United States has been and is the leader by a very wide margin in the production and in the technique of getting the oil out of the ground and of refining it into the very large number of products now on the market in various forms. Many of these end products are so different from the original crude oil that most people would be surprised, perhaps even shocked, to find that this or that bought at the store is wholly or partly a product of petroleum. Few people realize that we produce annually two-thirds of the total world production and that we have produced nearly two-thirds of all the petroleum ever produced. What the oil industry has meant in the development of industries in the United States can scarcely be overestimated. Where all the oils and greases necessary to lubricate our machinery would come from should oil production suddenly cease, no one can answer. In fact, many of our machines would have to be shut down. Few people realize that 90 per cent of all the automobiles in the world are found in the United States. If this country had not been so rich in oil, the automobile industry could not have had this remarkable development.

Our fourth greatest item in export trade for 1920 is "meat and dairy products," with a value of about $530,000,000. The recent lowering of the purchasing power of people in Europe is shown here most forcibly, for in 1919 the value of our export of these commodities was about twice as much, $1,134,000,000. This is still another case which proves one nation's prosperity depends on the prosperity of other nations as well.

The United States is still the greatest exporter of this group of commodities, although Argentina is coming to be a close second, as the United States is increasing in population and increasing the consumption of its own commodities. In this group hog products are the most important, in which the United States leads the world. The value of bacon exported was $156,000,000; lard, $143,000,000; and hams, $51,000,000. All beef products amounted to only $50,000,000, and Argentina is now the leading exporter of beef.

Iron and Coal Vital Factors

The fifth most important export group is known in the census reports as "iron and steel and manufactures except machinery." The total value of these exports was about $650,000,000, or about five times as much as in pre-war times. Our growth along this line has been one of the big outstanding features of our development. A century ago the United States produced hardly one per cent of the world's annual output of pig iron. Now this country manufactures yearly almost as much pig iron as all other countries combined, the Lake Superior mines furnishing 80 per cent of this.

A statement made years ago by the historian Ferrero that "Iron is the metal by which man creates, extends and keeps empire" was abundantly proven during the World War. Had Germany not seized the French iron mines early in the war, she could not have kept up the fight nearly as long.

Iron has been a leading factor along with coal and petroleum in modern industrial and commercial progress. Iron has supplied the implement, coal the motive power, and petroleum the lubricant. When it is realized that we have more high-grade iron ore than the United Kingdom, France and Germany combined, and that we have half of the known coal resources of the world, it must appear evident that the dominant position held by the United States has a real foundation in her natural resources.

The abundance of our coal as well as its exceptionally high quality has made our long-distance transportation possible. Even our rapid agricultural development owes much to this rich natural resource.

More and more our coal is entering into international trade, and in 1920 it was sixth in order of our exports, with a value of $350,000,000. In addition was the fuel or bunker coal, with an added value of over $80,000,000. The United Kingdom built up her proud title of "Mistress of the Seas" by her coal located near the sea. Yet her total reserve is less than one-tenth of the coal reserve even of our Western plains.

Blessed With Natural Resources

Only seven of the leading commodities have been discussed. To discuss all would be burdensome. The richness and variety of the resources of the United States is beyond comparison with those of any other country. We have been blessed beyond what any of us would have dared ask for. As long as civilization lasts, the United States must be a leading factor as far as natural resources are concerned. The only thing that can possibly befall this country is that the people shall no longer be proper stewards of the great wealth that has been given them and their great heritage be taken away from them.

The American citizen has much to be proud of, and this is a real part of patriotism. The conditions are here, if the people live up to the high motives which moved the founders and which have been the dominating influence in American life, for the United States to be able to distribute throughout all time with an unselfish hand to all the suffering and starving world its blessings and its ideals. May the American people realize their inheritance in wealth and in traditions and thus lead on ever to a more glorious future.

Ruin, so-called, is often only future success in a jumble.

Thoughts

by Dr. Frank Crane

MONEY

MONEY has been called the root of all evil. It is the fashion for moralizers to curse it. Meanwhile we each of us seek it.

But this is the evil in money: its segregative function. By this I mean its tendency to separate men from one another. The conserving, saving, redeeming forces in the race, such as love, labor and worship, operate to bind men together. Wealth disjoins. As soon as a man becomes rich he moves to the suburbs. The richer he becomes the thicker are his walls, the wider is his park and the higher his fence. He begins to take his pleasures in exclusive forms, such as select clubs, expensive wines and private yachts. This is the peculiar poison in money. For whatever draws one aside from the common lot is vicious. Caste, hereditary nobility and hierarchies have bred all manner of physical, social and moral pests because they fenced off portions of the human race. The Devil is the father of all fences. Plutocracy is the last enemy of democracy. Humanity has still a long way to go and many deep lessons to learn before it shall find the wisdom and the courage to sweep away its last divisional force, the irresponsible control of wealth by the individual. There is but one problem before the world; it is: How can we get together?

THE SKY

ALWAYS above our huge moiling city is the still sky. The sky clasps the restless earth in its arms as a mother holds a fretful child to her bosom. Just to look up is to receive a revelation of the vast quietude in which our noisy world floats. I would have my life like Ruysdael's picture of "A Distant View of Haarlem," where there are some six inches of landscape and eighteen inches of sky. The more of that infinite azure we can get into our feeling, the more we let it top and dominate the little present, the nobler shall we be. It is when we look down and about us, and are absorbed in the petty business and schemes of the moment, that we despair and call ourselves worms of the dust. But when we raise our eyes to that miracle of majesty above, sometimes of gentlest, unflecked blue, sometimes dotted with flocks of lamblike clouds, now thick and close with mist, and again remotely dark, sown with twinkling worlds, now full of rushing war-clouds, booming thunders, and fierce, swift lightnings, and then soft and tender and still as the holy adoration of a nun; never the same for two hours together, but always so wide and wonderful and great; when we regard this "majestical roof" of the theater to which our lives are appointed we are moved to play the man. I wish it might be said of me: "The stars have merged into his soul."

SMILES

HAVE you ever noted the differences in smiles? Some people smile as though it hurt them; when some others smile, it hurts you. There is the professional smile of the gentleman who wants to sell you a twenty-dollar suit for twelve-fifty, and the pious smile that does not at all approve of you but wants to rent you a pew, and the supercilious smile that knows better but will not argue with you, and the malicious smile that is glad you got what you deserved, and the smile feminine that goes to your head like wine, and the smile gastronomic that comes with Roquefort and coffee, and the smile minatory that is like a rattle to warn you the snake is going to strike, and the smile complacent that one wears when he thinks that he has been particularly clever. Curious how many meanings can be conveyed by the mere twisting of the mouth-line.

The best smile is that of an unbeautiful face. There is always something affected in the smile of beauty, but the smile of a homely person is a triumph of sheer good nature.

The best recipe for charm, if not beauty, is not any kind of facial massage, nor lotion, cream or powder, but it is to let a strong, unselfish heart shine through whatever kind of front window God has given you.

COMMERCIALISM

IT IS the fashion to curse our day because it is given up to money-making. Cold, hard commercialism is said to be destroying the good old customs and graces. As a matter of fact, the business of money-making is the most civilized occupation the race ever took up. Commercialism has ended slavery, abated war, limited and abolished thrones and tyranny, ousted superstition, and developed the individual virtues of self-control, economy and sobriety. Compare it with feudalism, it is less picturesque but more merciful; with aristocracy, it has less display but more justice; with religious rule, it has less emotion but more liberty. Trusts may be as greedy and godless as any form of special privilege that ever oppressed man, but there is this to say of them: they can as a rule thrive only upon the prosperity and never upon the poverty of the masses. It is the rising importance of profit-getting that is the severest practical check upon militarism. As an institution money-making must play fair in the long run or it will destroy itself; no business house can continue on any permanent basis except truth-telling. Compare this with the ancient frauds and sacred, protected, legalized injustice of the hereditary nobility. When we shall have once worked out some feasible plan for justly distributing profits, when we shall have done away with all special advantages to certain people, including tariff and inheritance, we shall find universal working for wages the most equitable arrangement under which the race can live; we shall achieve the true brotherhood of man.

COMMON STOCK

THE fiction of hereditary greatness dies hard. Leonardo da Vinci, the universal genius, was born out of wedlock. Goethe's son was a weakling. Napoleon's parents were insignificant. Abraham Lincoln's parents were poor and illiterate. Jesus came from a family of laborers by the day. There is only one genuinely great strain in human blood, the common strain. The Preferred Stock of the race is the Common Stock. The real rulers of men appear as wild flowers, growing in untilled land, blossoming on the highway. The plants in the royal hothouses, the Caesars, Romanoffs, Hohenzollerns and Wettins, all grow spindling. The future Garibaldi or Milton is, as probably as not, reaching for cookies in your pantry at this moment. In greatness there is no heredity. We inherit characteristics, but not character. The quality we call greatness breaks out in a coal-heaver's family as often as in a ducal palace.

A man was trying to sell some puppies on a street corner. A passerby asked him: "What's the breed?"

"Half Boston bull," was the answer.

"What's the other half?"

"Oh, I don't know! That's just dog, I suppose."

The greatness in any man lies in the part of him that is "just man." In the ultimate struggle between man and man it is not family that counts, nor special gifts, nor talents, nor possession; it is the race force, it is the amount of humanity he has.

Always put a certain amount of play into your work, and of work into your play: it will make both "go" easier.

The BUSINESS of HOUSEKEEPING

by Isabel Bevier

Director Of Home Economics
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THE art of Housekeeping is a very old one. The science of housekeeping has been studied with varying degrees of success for many years, but the business of housekeeping is a comparatively new term.

There are several reasons for this state of affairs. First, for years tradition and sentiment have worked against the participation by women in either politics or business. Those realms were to be left entirely to men if a woman wished to be considered really feminine in her tastes and activities.

But "the world do move" and women move with it and sometimes even ahead of it. Business implies a place, equipment, capital, and organization of resources and activities. For this business of housekeeping, woman has long had a place, equipment sometimes good, sometimes bad, but when she begins to consider income, outlay, resources, capital, she is dealing with practically unknown quantities, dependent too often upon the good will of the man of the house.

The war did a good many things to and for people and one of its best gifts to women was to provide a stimulus and outlet for her abilities. Judged by former standards, women entered the most surprising occupations and, more curious still, made good in them. Her war record is marvelous—one and one-half millions in munitions, and another million more in industries allied to war. These activities left many women with a sense of self respect, power and money which they had never known. Is it to be supposed that a woman who has had that experience will be content to work for her board and clothes in a poorly equipped, unorganized household? Not at all. One great lesson has been learned. Moreover, the spirit of the times is helping her on. From the centers of influence in the cities comes the cry, "Thrift, Thrift, Wise Spending." From the Agricultural Association and Farm Bureaus comes the word, "Put this production and distribution on a business basis, *organize* this farm business." The woman in the city and in the country is part and parcel of this movement and she turns to her field to organize it.

I believe within ten years the woman in the home will have a pocketbook and that there will be money in it; not the one dollar or the five dollars that the man has grudgingly given, but one hundred dollars or five hundred dollars, her share of the business—a recognition that it is worth something to get three meals a day, to take care of the house, the children, the unnamed and unnumbered calls on time and strength that fall to the woman in the home. When that recognition comes to the home, a real partnership has begun which will prove an incentive to satisfactory and comfortable living.

Assuming that the woman is to undertake this business of housekeeping, where shall she begin? There are many methods of attacking the problem. For our purpose this is chosen:

First, the place.
Second, the equipment.
Third, the capital to be invested.
Fourth, the organization of work.

Is the place in town or country? Large or small? Distance from school, church, market?

Is the house supplied with water, gas or electricity? How is it heated? Lighted? Are there labor saving devices, washing machines, vacuum sweeper, hard or soft-wood floors, rugs or carpets, or is there a coal stove, a well at some distance from the house and soft water at the barn?

What is the capital to do this work with, the money that can be depended upon, the brains, the people, the spirit, to keep this machinery going? Is one pair of hands largely responsible for doing all the work? Is the money to be dependent upon the activity of the hens?

What kind of family life is to be maintained? What is the dominating idea; to make money, raise a family, buy land, or to try to have a balanced life of work, play, love and worship?

These are some of the questions to be answered before the business of organizing can be begun. One must know whether one can have twenty dollars per month real cash or fifty. One must know whether the cash is at hand or if the grocery bills, for example, are to run until the corn or the hogs are sold or the monthly salary check is received.

Daily Program of Work

So much by way of background and understanding of the situation. Now comes the real problem of running the house, not for one week or four, but for fifty-two.

Strenuous objection is often made to bringing into any discussions of the home talk about time schedules. The stock objection is always made that the baby must be attended to when it cries, that time schedules belong to factories and schools, but in these days the Better Baby Movement has reduced the baby's day to a very definite schedule for sleep and food, so an attempt may be made to have a time schedule. It will vary according to the duties. The one for the country home may read after this fashion:

5:00- 6:30 A.M.—Rise, dress, prepare and eat breakfast.
6:30- 8:30 A.M.—Clear away breakfast, wash dishes, care for milk, chickens, get children off to school.
8:30- 9:30 A.M.—Make beds, do necessary daily setting in order of living and dining-rooms. Or if it is ironing or baking day, or both, the beds may be allowed to air longer and baking attended to until time for preparation of the noon meal, to be ready by 11:30.
11:30-12:30 Noon—Noon hour.
12:30- 1:00 P.M.—Dishes washed.
1:00- 2:00 P.M.—Rest time.
2:00- 4:00 P.M.—Finish ironing, or set house in order, or sew or mend.
4:00- 5:00 P.M.—Get supper, gather eggs, water the flowers.
5:00- 7:30 P.M.—Eat, wash dishes, care for milk, chickens, children.
7:30- 9:00 P.M.—Read, ride, social life.

The town woman's schedule might read as follows:

6:00- 7:30 A.M.—Rise, dress, prepare and eat breakfast.
7:30- 8:30 A.M.—Children ready for school, straighten dining-room, see to ice and milk. Supplies.
8:30-12:00 M.—Wash, prepare lunch.
12:00- 1:00 P.M.—Lunch.
1:00- 1:45 P.M.—Wash breakfast and lunch dishes.
1:45- 2:30 P.M.—Rest.
2:30- 4:00 P.M.—Read, sew, mend.
4:00- 5:00 P.M.—Walk with children, call, shop.
5:00- 6:00 P.M.—Get dinner.
6:00- 6:30 P.M.—Eat dinner.
6:30- 7:00 P.M.—Wash dishes.
7:00- 9:30 P.M.—Time for social or higher life.

In these two schedules some of the daily processes have been indicated. Undoubtedly they will not be adapted to many cases, but they are typical of some kinds of life, and the real problem is for each housekeeper to study her own processes and see what is the feasible time schedule for her. In the same way she must study the grouping of her equipment and see if her stove, sink, work-table and supplies are so grouped that she can work rapidly, or if time is lost because of bad arrangement or poor equipment.

For all people life is largely made up of choices. The woman in the home, as out of it, must study her own particular problem if she would make a wise choice.

SELECTION OF SUPPLIES

A. Equipment—Furnishings.—Only "newly-weds" buy all the equipment at once and so have the opportunity or the necessity laid upon them to balance the merits of the dining-room table against the hair mattress or to decide whether the money shall be expended for a sofa for the living-room, "because people will see it," or an electric washer to help mother.

Certain general principles hold in the selection. One must have good tools in order to work efficiently. One can *rest* with only a few articles about. So get the tools to work with and the necessary articles, an easy chair, a few good books and prints, a comfortable bed, for rest and recreation.

Again, remember every article purchased means one more thing to be taken care of. So be sure you are willing to wash it or dust it or polish it before you decide to buy it. Some bread-mixers take as much time to wash as to mix the bread by hand. Stoves with nickel trimmings require care, as does furniture with bunches of grapes for decoration. Beauty and use are not conflicting terms in house furnishing. A few pieces of furniture with good lines in a room, with attractive color in paper, calcimine or paint on walls, and good woodwork, one good picture and even rag rugs on a hard wood floor, may bring comfort and inspiration, but a collection of furniture of curious forms, crude wall colors with expensive carpets of bad design, a mantel full of cheap ornaments, never can invite to rest or inspire good thinking. Most household equipment must be selected with a view to its wearing qualities. Slowly but surely one can collect in the home durable, beautiful pieces. If one buys always the cheap article, it is not likely to wear and it is rarely beautiful; so one lives in the midst of ugliness. Henderson says, "An ugly room badly lighted, poorly ventilated, inadequately heated, must be regarded as morally reprehensible. It is the projection of an evil thought which, entering to consciousness, lowers the level of human life."

Real lace curtains belong to royalty, from which America is happily free. Simple cotton ones are much better adapted to the country bedroom or the city-smoked living-room, because they can be easily laundered and kept clean, which is a large element in their attractiveness. Pretense is as undesirable a note in a home as anywhere else in life. One of the fundamental questions to be asked early in the founding of a home, what scale of living is to be represented. must be answered as honestly for the kitchen as for the living-room.

B. Food.—One of the abiding good results of the war is the knowledge it gave to all classes of people of the importance of food, both on the side of health and money.

Each study of the cost of living emphasizes the importance of the woman as the spender of the income, particularly on the food side.

A good part of the United States has had a chance to learn that there are five great groups of foods, and that food has three great uses, namely, to build tissue, furnish energy, regulate body processes. Just this fundamental knowledge makes a good beginning for the wise selection of an adequate diet.

The following scheme (from *Food Calendar,* by Nina B. Crigler, University of Illinois, Extension Service) is perhaps one of the easiest devices for insuring a wise selection of food:

FOOD CALENDAR

All five groups should be represented in the diet every day.

		The Most Valuable of All Foods
Group I Foods characterized by mineral substances and organic acids.	Spinach or lettuce Peas or string beans Tomatoes Turnips or carrots Cabbage or onions Other vegetables Apples or pears Oranges or grapefruit Other fruit Berries Fruit gelatin	It is not always easy to give the family just the proteins and minerals and fatty foods that they must have to maintain health. Milk contains them all. It is the most valuable of all foods.
Group II Foods characterized by protein.	Lean meats Poultry Fish Oysters Milk Cheese Eggs Dried legumes Nuts Cocoa (beverage) Custard Ice cream	Milk proteins are second to none for health and growth. The protein in one quart of milk equals that in 7 ounces of sirloin. One quart of milk equals 4.3 eggs.
Group III Foods characterized by starch.	Flour or meal mixture Bread Crackers Macaroni Rice Tapioca Cereal breakfast foods Other cereal foods Potatoes	Milk is a cheap source of protein. At 15 cents a quart, milk is as cheap as sirloin steak at 35 cents a pound. At 18 cents a quart milk is as cheap as eggs at 50 cents a dozen.

Group IV Foods characterized by sugar.	Sirup Honey Preserves Jellies Dried fruits Candy Sugar Frozen ices	Milk contains two types of the accessory substances (vitamines) without which health and even life is impossible. One type is associated with milk fat.
Group V Foods characterized by fats.	Butter Cream Lard Salt pork Bacon Chocolate Vegetable oils	Other foods contain these substances, but only a few foods contain them in so useful a form as milk.
Beverages	Coffee Tea	Milk should be kept clean, cold, and covered.

And the following rules for wise buying (from "Food and the War," issued by the United States Food Administration) are likewise helpful:

"1. Spend from one-fourth to one-third of your food money for bread, cereals, macaroni and rice.
"2. Buy at least from one-third to one-half quart of milk a day for each member of the family.
"3. Spend as much for vegetables and fruits together as you do for milk. If you use one-half quart of milk for each member of the family, this may not always be possible; then spend as much for vegetables and fruit as one-third quart of milk a day would amount to.
"4. Spend not more for meat and eggs than for vegetables and fruits. Meat and eggs may be decreased with less harm than any of the other foods mentioned. The amount spent for meat may decrease as the amount spent for milk increases."

Both the schemes noted above imply that the woman who is responsible for the expenditure for food is putting considerable of thought into this part of the business of housekeeping.

Other factors, too, besides the group, cost and nutritive value, enter into this work of buying food.

Take the element of time—when shall the buying be done, and how often? There are people who at four o'clock in the afternoon discover that a yeast cake is needed and immediately the telephone request goes in that it be brought out. A few moments devoted in the morning to the needs of food for that day would have made it possible to have included that yeast cake in the morning's order of perishable foods.

Quantity Buying

Another factor is *quantity.* The importance of fresh vegetables, fruits and milk to assure proper content of vitamine makes some daily buying necessary, but staple articles, such as sugar, salt, crackers, flour, and many others, can be bought to advantage in quantity. The question of storage space enters into the question of the quantity, but almost any home permits of some buying in quantity, and this method saves both time and money.

One must remember that somebody must pay for the work of getting food into packages, advertising, transporting and delivering it. Usually the consumer contributes his full share in the price he pays for the finished sanitary product.

One cannot expect to have wrapped bread or certified milk for the same price as unwrapped bread and dirty milk. Olive oil bought by the half-pint bottle for 65 cents, which contains not over 1 cup, makes it cost at the rate of $10.00 per gallon instead of $7.50 per gallon for the same oil in gallon cans.

The method of buying depends upon several factors, upon the amount of storage room, whether one has the money to buy in quantity and for cash, whether the goods purchased will keep, whether one has time to prepare the food from the same materials.

One other factor which enters into the cost of food is its seasonableness. If the dweller in the North will have strawberries in mid-winter, she must expect to pay the cost of transportation and consequent loss entailed by the process. The wise buyer does not expect to buy sugar in the canning season, but in January or February, and she prepares her own cold-storage eggs for the winter of her need.

Going to Market

The question of how to buy has been very widely discussed, and one is exhorted on all occasions to visit the market and to avoid the telephone. Here again hard and fast rules fail. Many women with little children must order by telephone, and it is an open question in the writer's mind whether daily visits to the market are really worth while. It is necessary to know the markets and the men with whom you deal, but that can be acquired without a daily visit. Fifteen cents for carfare and an hour and a half of time consumed in going and coming, marketing one and one-half dollars' worth of food, seems an undue proportion of the day to be given to that purpose. Moreover, one may be tempted to buy unnecessary articles because "they look good and might come handy." This may be a confession of weakness, but it is a form quite common to those who frequent markets. After a time a reliable dealer knows the character of the produce you buy quite as well as you do, and it is to his interest and pleasure to serve you. The woman should go to market often enough to know that it is sanitary in its practices and to know on what days there is the best stock from which to select. For example, one woman said: "I never have company Monday night because there is nothing in town to buy except that left from Friday." In other words, that town got its perishable goods Tuesday and Friday.

Quality of food and method of preparation are important elements in any wise use of foods. It is worth while to know how much less the meal will cost when Hamburger steak is substituted for the porterhouse or baked potatoes for stuffed ones, or Graham bread for nut bread. Much as women dislike "lists," it would save them much time, money and worry if more data were kept, such as the cost of various kinds and cuts of meat, of forms of cooked potatoes, of different varieties of bread, or of different desserts.

Housekeeping on a Business Basis

One reason housekeeping does not get on a business basis is just because women do not keep the data. Many of them have made coffee for ten years and yet have no idea how many people can be served by one pound, nor the respective cost of serving a company of fifty people with tea, coffee or chocolate. "The tyranny of things" might be lessened if once located in black and white; then the woman would not need to spend any energy wondering "how I did last time." She could say with certainty, This meat course will cost so much; this salad so much; this dessert so much; and she could also say, I will make up for my cheap meat by a salad they all like, or I will omit the salad and have a good meat and vegetable course and inexpensive but appetizing dessert. The question of the amount of time and energy to be expended in preparing food materials is an important one. It takes more time to prepare and serve strawberries in a shortcake than to use them raw, and unless the shortcake is very good, the time, labor and material spent in preparing the shortcake are certainly lost. One other method is sometimes practiced under the delusion that one is saving money. Some women spend much time and some gas in using up "left-overs" by adding whipped cream and dates. As a matter of fact whipped cream and dates are good any time without "left-overs." A better practice would be to avoid in so far as possible having "left-overs." Dried cake is dried cake, whether you cover it with a sauce or not. Better make a smaller cake. Good hash is appetizing, but meat should not be made into hash unless one knows how to do it *well*.

Many women have not yet learned to read labels intelligently, but that is one of the first prerequisites to wise buying. They ought to understand that a jam labeled "compound" may not be made always of so harmless material as hayseed.

So much for the machinery of buying; for the knowledge that enables one to do it wisely. It is evident from the foregoing that a variety of materials and methods are to be used, that there is possible for each family or group a rational selection of food, both in buying and eating. Cheap materials and many devices to save expense are sometimes necessary, but the real needs, dietetic and economic, of well-to-do families are more wisely met by a skillful combination of the cheaper with the more expensive food materials. It does not require a table of fuel values to learn that corn-meal, wheat-flour, navy beans and brisket of beef are foods low in cost in proportion to their total food value; nor another to show that sweetbreads, mushrooms, chicken broilers and cream are expensive forms of food; but it is interesting to note with such data at hand that rib-roast and white-fish at the same price per pound have a very different value in calories or fuel value, and most people are surprised to find that beef-heart, which can sometimes be bought for five cents per pound, has very little less fuel value than tenderloin, which may cost sixty cents per pound. It is not reasonable for families of moderate means to spend an undue proportion on the table, any more than it would be considered wise for them to dress in silks at breakfast-time or furnish their rented house with Oriental rugs. Neither must one cultivate the attitude of a martyr if grape-fruit is not forthcoming for breakfast every morning.

The present generation has lost the sense of proportion. They consider luxuries as their due. The problem of simple living is not so easy since the food products of many lands are at our doors, but it is as desirable as ever, both from the standpoint of economics and health.

C. Fabrics—Clothing.—The woman who would buy food for her household finds help at every hand from the daily newspaper to a Government bulletin, but for the supplies of linen, cotton, wool or silk in household fabrics or clothing for the family so much information is not at hand.

The labels are neither so numerous nor so enlightening, the adulterations are more skillfully concealed, the questions of dyes, shrinkage, filling, are quite appalling to the woman who with difficulty has snatched an hour for shopping from a day already full of seemingly necessary duties.

Here again one must study and think and choose, not only goods but times and seasons. The "white sales" in January are helpful to the woman who has looked over her supplies in these lines and has some idea what household linens must be replaced, what underwear will be needed within the next six months. There are simple tests for determining whether a piece of goods is silk, linen, cotton or wool. She must learn these and apply them to her samples. A hasty, thoughtless purchase often leaves a long time for regret. Collect the samples and test them, and then at least one step has been taken toward wise buying. There are standard brands, trade names, that really mean something in fabrics that can be depended upon; these must be learned. In clothing, suitability to use, to the wearer, in color, line and form, distinguishes the well dressed woman. House dresses should be house dresses easily laundered, not discarded party gowns. Street costumes should not make the wearer conspicuous either by brightness of color or badness of line and form.

Think of the hats which make the wearer seem to cleave the air, or the dress which gives the woman the shape of a barrel. Here again the rule is, buy few clothes, but of good material and fast colors, have them made in lines adapted to your figure, without too much attention to the passing fashion; then you can wear them a long time and be well if not fashionably dressed.

The business of housekeeping, as any other business, is to be judged not only by the efficiency of its machinery, but also by the results, tangible and intangible.

Housekeeping has many sides; a good many corners have to be watched at the same time and all the time. The novice finds it hard on both body and mind, so needs to have the processes grouped and arranged, needs machinery to help her over the top.

Proper distribution of time, careful selection of food, wise buying of fabrics and furniture, intelligent care of children are important parts, but not the goal of the business of housekeeping.

The reason for attention to these separate parts is to eliminate the non-essentials, to prevent waste of time, money or energy, and so to make possible a better goal, a larger life for all concerned. Cabot says: "Men live by work, play, love and worship." The real goal is a well ordered home in which old and young, weak and strong, may work, play, love and worship according to their need. The women in such homes will have time not only for the household cares, for its self-denials, but also for the quiet hour of rest and inspiration, for the satisfactions of social intercourse in the home and community. The man will find in such a home comradeship, recreation and inspiration, and together men and women will do their share in the world's work.

STAIN REMOVAL

by Mate L. Giddings

IN every well managed home it is both practical and desirable that the housewife know how to remove simple stains. With knowledge, simple equipment and patience both time and money can be saved. Directions should be followed very carefully.

Stains are much more easily removed before the garment is washed and while the stain is fresh. Hot water sets many stains; cold water is always safe. The process of the removal varies, depending upon the type of the stain. A fruit stain is flushed away with *boiling* water; grass stains are dissolved and carried away by alcohol; grease stains are absorbed by such solvents as ether, benzine or a blotter and a warm iron; and in using a bleach the stain is oxidized.

Alkalies and Acids

Strong alkalies injure the fabric. Dilute ammonia and dilute acids are safe to use. When bleaches are used be careful to rinse thoroughly afterwards. Oxalic is one of the safest acids to use on colored goods, and it is successful with many different kinds of stains. Small known spots, especially grease, on non-washable materials may be easily taken care of with ether, carbon tetrachloride, benzine or gasolene.

General Directions

If the stain is not known and is a bad one always take the garment to a professional cleaner—and take no chances with your own inexperience.

1. Know the nature of the stain.
2. Know the fabric.
3. Begin work as soon as possible after the stain is noticed. Cover fresh spots with talcum powder or meal to prevent spreading and sinking into the fabric.
4. Know the effect of the reagent being used upon both the color and the fabric.
5. Have necessary chemicals, materials and equipment at hand before beginning.
6. Use dilute reagents, applying them several times if necessary.

7. Work rapidly when using chemicals so there is as little time as possible for them to act on the fabric.
8. Remove the reagents after the stain has disappeared.
9. For rubbing or sponging, a cloth of the same material is best.
10. Use bleaches only as a last resort—then mild ones like borax, dilute ammonia and hydrogen peroxide. Be sure the bleach is washed out well.
11. Rub a spot toward the center with a circular motion.
12. A pad of soft, clean cloth or white blotting paper under the fabric absorbs the stain and excess chemical and prevents a ring forming on the goods.

These chemicals and materials will be found useful:

For Non-Washable Goods	**For Washable Goods**
Alcohol*	Oxalic acid (dissolve 2 tablespoons in ¾ cup water)
Ether*	Dilute hydrochloric acid (1 part acid to 4 parts water)
Benzine*	Borax
Carbon tetrachloride*	Lemon juice and salt
Chloroform*	Cream of tartar
Ammonia	Citric acid
Chalk	Flowers of sulphur
Starch	Hydrogen peroxide
Borax	

*Note: These should be used out of doors.

Spot Remover

Ether
Alcohol
Ammonia
} Equal parts

Javelle Water

One-half lb. chloride lime dissolved in 2 qts. cold water. Dissolve 1 pound washing soda in 1 qt. boiling water. Pour the clear liquid from the chloride lime into a bottle and mix with the solution of soda. Cork and keep in a dark place.

Suggested Equipment

Soft non-linting cloths, white blotting paper, medicine droppers, a small brush, a bowl, a cup and the necessary chemicals in small convenient bottles.

A few suggestions for removal of some of the more common stains on clothing follow. As a general rule it is best to try the simpler remedies first and to use the more mild reagents whenever possible. Very few stains disappear magically. Remember several applications are practically always needed and are more effective than one or two.

BLOOD STAINS

Never put blood stains into hot water first, as it sets the stain.

1. Soak in cold water. If stubborn a little ammonia or salt added to the water will loosen the stain. Then wash with warm water and soap.
2. Cover spot with wet starch—let stand several hours and when dry brush off. Repeat if necessary. This is a good method for non-washable goods.
3. A mild bleach, such as hydrogen peroxide or borax (or javelle water if necessary), will remove any faint traces of the stain.

FLY PAPER STAINS

Sponge with gasoline or benzine.

FRUIT STAINS

1. Pour boiling water through the stain from a height. Stretch the stained goods over a good-sized bowl.
2. A small amount of borax or ammonia added to the boiling water often hastens the process.
3. Warmed wood alcohol will loosen an old and stubborn stain. (To warm—place pan of alcohol in another pan of hot water.) **(Never** have alcohol near a flame.)
   Any traces of the stain in table linen will come out in the washing and boiling in the laundering.

GRASS STAINS

A. **Washable Goods.**
1. Wash in cold water and soap.
2. Soak in alcohol. Then rub spot with wet cream of tartar. Let stand and then rinse well.

B. **Non-Washable Goods.**
Use dilute ammonia.

GREASE STAINS

A. **Non-washable.**
1. Black wool—wash in warm water with small amount of borax dissolved in it.
2. Cover spot with a powdered absorber, such as starch, talcum, French chalk or fuller's earth (the last is for dark colors only). Let stand several hours and then brush off. Repeat if necessary.
3. Place clean blotting paper under the spot and run a warm iron (not hot) over the stain. This is especially effective with paraffin or candle tallow.
4. Any of the fat-solvents—ether, chloroform, benzine or carbon tetrachloride—are very satisfactory.

B. **Washable.**
1. Naptha soap and cold water.
2. If old, soften with lard and wash with cold water and soap.
3. Soak auto grease in, then wash in gasolene and then wash in soap and water.

INK STAINS

Some ink stains are easily removed while fresh with cold water. Always remove an ink stain before the garment is washed.

1. Oxalic acid followed by dilute ammonia is both safe and satisfactory for all colored goods. It is effective with ink stains on carpets also. Use first acid and then ammonia. Repeat until the stain has disappeared. Rinse with clear water.
2. Lemon juice and salt (for white goods only) acts quickly.
3. A bleach may be used if the stain is on white goods and is a stubborn one. Be sure the bleach is rinsed out well.

IRON RUST

A large percentage of iron rust on goods is the result of some soap being left in clothes and the use of a bluing containing iron. An aniline blue is free from iron, and very satisfactory.

A. **White Goods.**
1. Lemon juice and salt plus sunshine.
2. Dilute hydrochloric or oxalic acid. Rinse well afterwards.
3. Javelle water (2 tablespoonfuls to the boiler) in laundering will remove it if it isn't a bad one.
4. Boil in a solution of cream of tartar (4 teaspoons to pt. of water).

B. **Colored.**
Wet the stain, cover with cream of tartar, rubbing it in well. Rinse in clear water.

MEDICINE STAINS

Sponging with alcohol or soaking in alcohol will dissolve these. (Wood alcohol.)

MILDEW STAINS

This is a mold which grows on the fiber of the goods when damp clothes have lain too long.

1. If fresh, wash carefully with soap and cold water.
2. Soak in sour milk (for white only) and place in sun. Keep moist.
3. Flowers of sulphur spread on a moistened stain act as a bleach.

PAINT AND VARNISH STAINS

1. Wood alcohol or turpentine.
2. Chloroform on delicate colors.
3. Benzine.
4. If dry soften with fat, then soak in benzine or wash with soap and water.

PERSPIRATION STAINS

Chloroform removes the odor.

A. **Non-washable.**
Sponge with dilute ammonia.

B. **Washable..**
Wash carefully with warm water and soap. If on white material, boiling will remove any odor.

SCORCH

A. **White Goods.**
Keep wet and bleach in the sun.

B. **Colored Goods.**
Wash carefully with a mild soap.

TEA AND COFFEE STAINS

A. If stain is from clear coffee or tea pour boiling water through from a height.

B. **With Cream.**
Wash with cold water and soap. Soak or boil in water in which a small amount of borax has been dissolved, if a faint stain remains.

THE MAGNET

The exact principle which causes a magnet to take hold of metals and cling to them with a grasp that overcomes the force of gravity, like electricity, is one of nature's unsolved mysteries. We merely know that a piece of iron which has been electrically treated will attract and hold various metals. The force it exerts we call "magnetism" and let it go at that.

The most logical explanation would appear to be that an electrically-treated piece of iron gives off a force analogous to that given off by radium, in that it will affect other pieces of metal without materially lessening its own power.

The name "magnet" is derived from the mineral "magnetite." This, in turn, is so called because it was first discovered to exist in magnesia. Magnetite is a natural magnet, of which loadstone is one of the best known varieties.

1,900-YEAR-OLD TOYS IN TOMB

There recently has come into the possession of the Berlin Museum a group of ancient Roman objects which were discovered in the tomb of a little girl of the period of the Emperor Tiberius, that is to say, some 1,900 years ago.

The objects, which must have been placed there by the child's parents, are in nearly as good a state as they were when the child lay dying with them in her arms.

There was a coin of Tiberius in the dead child's hand—the fee to give to the ferryman for the crossing to the other side. There was a box containing her little dolls. There was a little doll's table, too, and a doll's silver candlestick. The little girl had dressed her dolls and had "made them up," for there was a box of cosmetics with a picture on the cover.

Scold the child and spoil the disposition.

The schools of a country are its future in miniature.

The best citizen is the one who thinks for himself and acts for all the rest.

Puzzles, Problems and Conundrums

Puzzles

How can you plant ten trees in five straight rows with four trees in each row?

Make one word with the letters "nine thumps."

Arithmetic Problems

What number is that which added separately to 100 and to 164 shall make them perfect squares?

A man went into a store and said to the proprietor: "If you will double the amount of money I have in my pocket, I will buy $10 worth of goods."

The merchant agreed, and the man made his purchases. He then went into another store and repeated the same deal. After doing the same thing in the third store, he broke even.

How much money did he have at first?

A field is fenced with as may rails around it (16 rails to the rod) as there are acres in it. How many acres in the field?

How old is the boy whose father said: "My son is five times as old as my daughter, and my wife is five times as old as my son. I am twice as old as my wife, while grandmother, who is as old as all of us put together, is just 81."

Conundrums

What vegetable would represent the most thickly populated portion of the country?

How many eggs could you eat on an empty stomach?

What does an artist like best to draw?

Into what room do you go to have a tooth pulled?

Answers

1. Plant in the form of a five-pointed star. 2. The word "punishment." 3. The number 125. 4. The man had $8.75 at first. 5. 655,360 acres. 6. Five years old. 7. The onion is the (s)center of population. 8. Only one egg because then your stomach would not be empty. 9. His salary. 10. The drawing room.

THINGS WORTH REMEMBERING

Compiled By Nile C. Smith

A barrel of flour weighs 196 pounds.
A span is ten and seven-eighths inches.
First watches made in Nuremberg, 1476.
A hand (horse measure) is four inches.
First steamer crossed the Atlantic, 1819.
A form of telephone invented by P. Reis, 1861.
The first newspaper advertisement appeared in 1652.
To find side of an equal square multiply diameter by .8862.
The United States entered the World War April 6th, 1917.
Spectacles were invented by an Italian in the 13th century.
Soap was first manufactured in England in the 16th century.
To find area of a circle multiply square of diameter by .7854.
To find circumference of a circle multiply diameter by 3.1416.
To find diameter of a circle multiply circumference by .31831.
Napoleon I, crowned emperor, 1804; died at St. Helena, 1820.
Politeness is to do or say the kindest thing in the kindest way.
The estimated number killed in the World War was 7,450,200.
Twenty-seven nations were directly involved in the World War.
To find surface of a ball multiply square of diameter by 3.1416.
To find cubic inches in a ball multiply cube of diameter by .5236.
Doubling the diameter of a pipe increases its capacity four times.

Nearly three-fourths of the world's silver is mined in North America.

Harvard is the oldest college in the United States; established in 1636.

"Home is the father's kingdom, the child's paradise, the mother's world."

The first complete sewing machine was patented by Elias Howe, Jr., in 1846.

Measure 209 feet on each side and you will have a square acre within an inch.

Jamestown, Va., founded 1607; first permanent English settlement in America.

North America is the third largest continent. Asia and Africa have greater areas.

The World War began July 28, 1914; armistice was signed November 11, 1918.

St. Augustine, oldest city in the United States, was founded by the Spaniards, 1565.

The cash cost of the World War to April 30, 1919, is estimated at 186 billion dollars.

A gallon of water (U. S. Standard) weighs 8½ pounds and contains 231 cubic inches.

"Industry is the right hand of fortune, the grave of care, and the cradle of content."

The mucilage on the back of a postage stamp is made from the syrup of sweet potatoes.

A cubic foot of water contains 7½ gallons, 1,728 cubic inches, and weighs 62⅓ pounds.

Some female spiders produce 2,000 eggs. A queen bee produces 100,000 eggs in a season.

"The eye that drops for the misfortune of others should never shed a tear for its own."

Oberlin College, Ohio, was the first in the United States that admitted female students.

The highest record price of wheat in the United States was $3.45 a bushel, on May 4, 1920.

Havana is farther west than Cleveland, and Nome, Alaska, is farther west than Hawaii.

The United States has 6 per cent of the population of the world and 7 per cent of the land.

Postage stamps first came into use in England in the year 1840; in the United States in 1847.

Santo Domingo is larger than West Virginia and its interior is untraveled and little known.

"We should have peace and honest friendship with all nations; entangling alliances with none."

First telegraph in operation in America was between Washington and Baltimore, May 27, 1844.

The total area of the earth is 197 million square miles; the land surface is 54 million square miles.

The man we love is the one who thinks the most good and speaks the least ill of his neighbor.

On June 12, 1816, snow fell for three days in Maine and the ground was frozen half an inch deep.

The rainiest spot on earth is in India; Cheerapunji, India, averages 464 inches.

The highest record price of hogs in the United States was $23.60 per hundred pounds, on July 31, 1919.

The largest inland sea is the Caspian, between Europe and Asia, being 700 miles long and 270 miles wide.

The only university in the United States to offer a course in fisheries is the University of Washington.

The highest range of mountains is the Himalayas, the mean elevation being from 16,000 to 18,000 feet.

We never see 41 per cent of the moon's surface, but every part of it is successively turned toward the sun.

The bank deposits and resources of the United States exceed the bank deposits and resources of the whole world.

The lowest temperature in the U. S. on record is 63° below zero, January 1, 1885, at Poplar River, Montana.

The highest record price of corn in the United States was on November 16, 1917, when it sold for $2.40 per bushel.

One pair of rabbits might become multiplied in four years into 1,250,000, if not affected by disease or natural enemies.

There are 12,000,000 Negroes in the United States. They constitute one-seventh of the working force of the country.

The highest temperature on official record in the United States was July 10, 1913, at Greenland Ranch, California—134°.

Prior to the World War we owed other countries 5 billion dollars; foreign peoples now owe us in excess of 12 billion dollars.

Shetland ponies come from the Orkney Islands, near the Scottish coast. Their breeding is the principal industry of these islands.

Paris was known as Lutetia until 1184, when the name of the great French capital was changed to that which it has borne ever since.

Los Angeles County, California, ranks first among all the counties of the United States in the value of farm property and of crops harvested.

The highest mountain in North America is Mount McKinley, at the headwaters of the Suswhitna and Kuskokwim rivers, Alaska. Its height is 20,464 feet.

The passage of the migratory bird law has resulted in a saving of $20,000,000 in food to the United States, according to the Department of Agriculture.

Tobacco was discovered in San Domingo in 1496; afterwards by the Spaniards in Yucatan in 1520. It was introduced into France in 1560, and into England in 1583.

The five places in France where the United States troops particularly distinguished themselves were Chateau Thierry, Belleau Wood, St. Mihiel, Seicheprey and the Marne.

The world's highest peak lies in Tibet north of the British Indian border, and no European has ever approached nearer than 69 miles from its base, except during a very recent expedition.

For the first time in its history continental United States has reached the point where more than half of its population is living in the cities and towns of more than 2,500.

There are about 336,000 Indians in this country, exclusive of Alaska, distributed among some 130 reservations, of whom 180,000 are full-fledged citizens of the United States.

The value of Alaska's salmon products in one year is seven and a half times the original purchase price of that territory. A salmon has been known to produce ten million eggs.

The glow-worm is not a worm at all. It is a beetle, the female of which never gets beyond the larva-like form. Her mate is a hard-shelled little beetle not as luminous as she is.

A man will die for want of air in five minutes; for want of sleep, in ten days; for want of water, in a week; for want of food, at varying intervals, dependent on various circumstances.

The largest State in our grand republic is Texas, which contains 274,350 square miles, capable of sustaining 20,000,000 people, and then it would not be more crowded than Scotland is at present.

Benjamin Franklin said: "No matter how heavily the government may tax us, we are taxed twice as much by our idleness, three times as much by our pride and four times as much by our folly."

The Chinese and Japanese in their fables regard the Milky Way as a stream containing silvery fishes. African Bushmen and American Indians associate it with lights guiding the paths of wandering spirits.

A "monkey wrench" is not so named because it is a handy thing to monkey with, or for any kindred reason. "Monkey" is not its name at all, but "Moncky." Charles Moncky was its inventor.

The annual tobacco bill of the United States is $2,110,000,000, of which $800,000,000 is spent for cigarettes. We spend $200,000,000 more annually for cigarettes than for the yearly salaries of all the teachers in the United States.

Nevada, according to the 1920 census, now has only 0.7 population for each square mile. Rhode Island is our most densely populated State, with a population of 566.5 for each square mile. The census plainly shows an urban drift.

March 9th has been designated as a national fish day throughout the United States by a nationwide organization of fishermen, following a custom which has prevailed in other countries for many years.

"Parsons are preaching for the good things of the world, lawyers are pleading for them, physicians are prescribing for them, authors are writing for them, soldiers are fighting for them, but true philosophers alone are enjoying them."

This country now produces 24 per cent of the world's wheat, 60 per cent of its cotton, 75 per cent of its corn, 27 per cent of its cattle, 25 per cent of its dairy products, 40 per cent of its iron and steel, 20 per cent of its gold, 40 per cent of its silver, 52 per cent of its coal, 60 per cent of its copper, 66 per cent of its oil, and 85 per cent of its automobiles.

The United States Atlantic coast line is 1,773 nautical miles; the Gulf coast, 1,607 nautical miles; the Pacific coast, 1,571 nautical miles. The coast line of Alaska is 4,123 nautical miles; the Philippines, 11,444 nautical miles. The grand total of the coast line of the United States, including the Philippines, is 28,983 nautical miles. A nautical mile is 6,080 feet.

The largest body of fresh water in the world is Lake Superior. It is 400 miles long and 180 miles wide; its circumference, including the windings of its various bays, has been estimated at 1,800 miles. Its area in square miles is 32,000, which is greater than the whole of New England, leaving out Maine. The greatest depth is about 160 fathoms. It is 636 feet above sea level.

Watt-hour meters are the instruments used by most central station companies to measure the electricity supplied to their customers. The unit of registration on these meters is the kilowatt-hour, equal to 1,000 watt-hours. A kilowatt-hour, therefore, represents the use of electric energy equivalent to one kilowatt for one hour. In other words, if you use an ordinary electric flatiron and an electric toaster continuously for one hour, you consume, approximately, energy equal to 1,000 watts for one hour, or a kilowatt-hour. This is figured on the basis of a 600-watt flatiron and a 400-watt toaster, which are the sizes ordinarily used.

Some of the hardest work in the world is done by people who think they are playing.

If all the "tainted" money were burned, there would not be enough left for the people to use in conducting their business.

Somebody says, "I wonder if it isn't so?" Somebody else says, "I think it is so"; somebody else, "It probably is so"; somebody else, "It is so"; and then the whole community tell it as an up-and-down fact.

FIRST AID

by Dr Gertrude E. Moulton
Associate in Hygiene
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IN first aid prevention is worth more than cure. Many insignificant appearing wounds would not develop into fatal conditions, and many accidents could be avoided entirely if we trained ourselves to exercise common care.

That individual is of most value in case of serious injury or illness, who has, through repeated, insignificant opportunities, developed self-control and the aseptic habit. One who knows he cannot stand the sight of blood, or the thought of accident, can, by taking advantage of every opportunity to take out a sliver, sterilize a needle prick, or open a pimple with antiseptic precautions, overcome his weakness and make himself, potentially, a more valuable member of society.

Before attempting to care for any wound, have your nails clean and short, scrub the hands thoroughly, and if possible, dip them into an antiseptic solution of 1-2,000 Bichloride of Mercury. Do not dry them on a towel unless it is sterile. They will dry quickly by evaporation.

Superficial Wounds Without Severe Bleeding.—The majority of wounds come under this heading. Never consider any of them insignificant, for serious results occasionally follow even a pin prick. Encourage a slight amount of bleeding. If the part is dirty, it can be safely washed with clean hot water and soap, then cleaned with grain alcohol and painted with 4 to 7% Tr. of Iodine. Under any circumstances, the application of the Tr. of Iodine is a safe proceeding. Every wound, however insignificant, should be painted with some good antiseptic, the best being Tr. of Iodine. Always let the Iodine dry thoroughly before covering with any dressing. Do not be afraid to leave a wound exposed to the air. If, however, it is to be covered, place a sterile gauze or dressing next to it. Deep wounds, as punctured wounds from nails, etc., should

be encouraged to bleed freely (because of the danger from tetanus), and should be taken to a physician. If, however, this is impossible, the wound should be cauterized with heat or with pure carbolic acid, being sure that the most remote point is reached.

Wounds With Considerable Bleeding.—Check the bleeding as soon as possible. If the blood is bright red and is flowing in spurts, an artery of considerable size has been cut and pressure should be applied near the cut, and between the cut and the heart. If necessary, a sterile pad, or one which has been wrung out of water in which it has boiled for 15 to 20 minutes, can be pressed into the wound. If a vein in the neck is wounded, loss of blood may be so rapid that it is best to disregard the possibility of infection and press the cleanest thing at hand over the bleeding point.

Keep the patient quiet. Even if the bleeding seems thoroughly stopped, it may start again. After the bleeding is stopped the wound can be painted with tincture of iodine.

Do not give stimulants until the bleeding has stopped. Then one teaspoonful of aromatic spirits of ammonia in a half glass of water can be given.

Burns.—If without blister, the only thing needed is something to exclude the air and relieve the pain. In case of burns on the hand or foot the whole member can be held under clean, cold water until a dressing can be prepared. A paste of water and baking soda, or carbolized vaseline, or oil of any kind, or solution of Epsom salts is valuable. A very good dressing can be made by stirring from one-half to one teaspoonful of soda into an ounce of pure vaseline. Then put the bottle or jar which contains the mixture into a pan of water and gradually bring it to a boil. Boil for 15 minutes. This will sterilize the preparation, and if care is taken, it can be used for some time without resterilizing. Dip it out with a sterile instrument, as a spoon handle which has been boiled, and spread it on a sterile gauze. Cover the burn with this and bandage it into place. As soon as the pain is over it is desirable to expose the skin to the air.

If a blister is formed, it should be pricked with a sterile needle and the fluid pressed out gently. Care should be taken not to break the skin. In severe burns a doctor should be called immediately. If clothing is burned and sticks to skin, do not remove it, but cut it away gently. In case of burning by acid or alkali, the part should be washed with a solution of baking soda or weak vinegar and lemon juice.

Sunburn.—This may be prevented by gradually hardening the skin. Before exposure to sun or wind rub the skin well with olive oil. Any good talcum or boracic acid will protect to some extent. Treat as a simple burn. Avoid too much washing.

Foreign Body in Eye.—Unless it can be easily removed, less harm is done by leaving it in the eye until the patient can be taken to an oculist. Do not rub the eye.

Close the eye. The accumulation of tears may wash out the particle, or wash it into plain view so that it can be easily removed. If this is not successful, close the opposite nostril and have the patient blow the nose hard.

If no relief is felt, have the patient look up and at the same time press the lower lid down. If the particle is seen in the inner surface of the lid it can usually be brushed off with a soft, clean cloth.

To examine the inner surface of the upper lid, stand behind the patient and press gently across the lid about half an inch from its edge with a thin pencil or match. Have the patient look down and at the same time grasp the eyelashes and turn the lid up over the pencil or match. A drop of oil in the eye after the removal of the foreign body will soothe it.

Bites and Stings.—If the sting is left in the wound, extract it. It can often be pressed out. Strong ammonia should then be applied immediately. A paste of baking soda, clay or salt may also be used.

Nosebleed.—Do not blow the nose. Usually no alarm need be felt. Simple remedies usually suffice. Hold the arms above the head, place a roll of cloth or paper under the upper lip, between it and the gum. Apply ice or cloth wrung out of cold water to back of neck. Snuff cold water or salt and water (1 teaspoonful to a cup) up nose. If bleeding becomes alarming, send for a doctor and plug the nostril with a strip of gauze or thin cotton cloth. A pencil can be used to push the gauze up the nose. This should remain in place for several hours and then be removed with great care and gentleness.

Earache.—Consult a doctor at once. Heat may relieve the pain. This may be a hot salt bag or water bag or a few drops of alcohol in a hot, wet towel applied to the ear, or a few drops of warm sweet-oil dropped into the ear, which may then be plugged with cotton.

Toothache.—Consult a good dentist about every six months or any time there is anything wrong with the teeth. In case of a cavity, relief may be obtained by cleansing the cavity and then plugging it with cotton to which a small drop of oil of cloves has been added. If no cavity is found, apply a bit of cotton wet with camphor to the inside of gum, or use hot cloths or hot water bottle to face.

Hiccoughs.—Usually due to rapid eating or overeating, or indigestion. Hold the breath, take long breaths, drink glass of water in small sips, without taking a breath, or cause vomiting.

Frostbite.—Warm the part *away from heat* by rubbing with snow or cold water. When warm, wash part with alcohol and water or treat as burn.

Bruises, if slight, need no treatment. If severe, apply cold in the form of crushed ice in a cloth, or cloths wrung out of cold water and changed frequently. If very hot cloths are easier to get or more agreeable to the patient, they may be used, or cloths wet with arnica, witch hazel or alcohol and water may be used. Keep the treatment up for at least an hour to accomplish results. It will limit swelling and escape of blood into the tissues, and relieve pain.

Sprains, if severe, should be treated by a physician. Examination by X-ray is often the only sure way of differentiating between a sprain and a fracture. Do not use the joint after the accident. Apply heat or cold as directed under "Bruises," or plunge the whole part into very cold or very hot water, or hold under a water tap. Continue this treatment until pain is relieved and swelling is reduced to some extent, then elevate the part and keep it quiet. If a knee is involved, put the patient to bed and rest the knee on a pillow. After the pain and swelling have begun to decrease it is better to use the joint to a limited extent than to give it absolute rest. It may be given some support with a brace or strappings of adhesive tape.

Unconsciousness is due to a variety of causes, any of which demand immediate and expert treatment. In general, do not move a patient more than is necessary, keep plenty of fresh air around him; and keep him warm. If the face is pale and the pulse is weak, have his head as low or lower than his body. If the opposite is true, raise his head.

Fainting is the most common form of unconsciousness, and is caused by temporary lack of blood in the brain. It can be prevented, many times, by cold, fresh air, by a few whiffs of smelling salts, or by lowering the head between the knees. If these measures do not prevent it, put the patient in a recumbent position, with the head low, loosen all tight clothing, bands, etc., sprinkle cold water in the face, and continue to supply cool, fresh air, smelling salts, etc. When consciousness returns, a half teaspoonful of aromatic spirits of ammonia in water may be given.

Poisoning.—Send for a physician at once. If possible, determine what poison has been taken. Give the antidote if it is known and can be procured without delay. If not, give the whites of raw eggs, milk, or even strong tea. Then produce vomiting by pushing the forefinger to the back of the throat or giving a cup of lukewarm water into which has been stirred a heaping teaspoonful of mustard or salt. Repeat this dose every five or ten minutes for several doses. Sirup of ipecac, in one to two teaspoonful doses, usually produces vomiting. There are poisons in which it is best not to give an emetic, but in an emergency the general rule should be followed. If other symptoms, such as fainting or prostration, arise, they should be treated also.

Drowning.—It is desirable that everyone who is likely to have the opportunity to help in any such accident, thoroughly familiarize himself with the best methods of clearing the lungs of water, and of performing artificial respiration. The space is too limited here to describe these methods in sufficient detail, but they are published in every "First Aid" book and should be posted in boat houses and at bathing beaches. Frequent practice on a companion is helpful.

LIST OF REMEDIES WHICH IT IS DESIRABLE TO KEEP IN THE MEDICINE CLOSET

Alcohol.—Only pure grain alcohol should be used. This can be "denatured" by adding one to two per cent of carbolic acid and is then even more valuable as a mild antiseptic wash for the skin. It is cooling and stimulating.

Ammonia.—Keep corked with a rubber cork. Useful for stings, bites, etc.

Aromatic Spirits of Ammonia. (Rubber cork.)—Dose for adults, ½ to 1 teaspoonful in water every half hour for three doses. Useful in fainting, hysteria. shock, and often of value in headaches.

Bichloride of Mercury tablets (7.3 grains each).—POISON. (Should be kept with other poisons on a separate shelf and in a bottle or box distinctly different from those in which non-poisonous medicines are kept. A small bell might be attached to each bottle.) One tablet dissolved in from 2 to 5 pints of water makes a strong antiseptic for washing wounds, boils, hands, etc.

Boric Acid (Boracic Acid).—Half a teaspoonful in a glass of water is used for washing eyes or ears, or for hot compresses over boils, bruises and infected wounds. Used dry, boric acid affords some protection from the sun.

Carbolic Acid (liquid).—POISON. (Observe precautions as suggested under Bichloride of Mercury.) Useful as an antiseptic and gargle when one part is mixed with 100 parts of water.

Epsom Salts.—Used in solution for burns. Used also in constipation and dysentery. Dose, one to two teaspoonfuls in water.

Glycerine.—When mixed with an equal amount of water it is of value on hard and rough skin, chapped lips and chafed skin, and (warmed) in earache.

Oil of Cloves.—POISON. (See caution under Bichloride of Mercury.) Useful in toothache. One drop on a bit of absorbent cotton, placed in a clean cavity, relieves pain. Do not let the oil come into contact with the gums, tongue, or cheek.

Olive Oil.—Useful in burns, scalds, etc. Also (warmed) in earache.

Sirup of Ipecac.—Produces vomiting in doses of from one to two teaspoonfuls. Useful, too, to loosen a cough in beginning bronchitis, when taken in doses of ten drops every three hours.

Tincture of Iodine.—4 to 7 per cent. Use to disinfect wounds, scratches, cuts, etc.

Vaseline.—Plain, carbolized, and mixed with baking soda. (See treatment of burns.) Used as dressing for wounds, burns, etc.

Adhesive tape and packages of sterile gauze, bandages, etc., are also of value in the first aid cabinet.

SOME THINGS THAT ARE MISNAMED

Arabic figures were invented by the Indians.

Baffin's Bay is not a bay at all.

Blacklead is a compound of graphite and clay.

Catgut is gut of sheep.

Elements—Fire, air, earth and water, called the four elements, are not elements at all.

Galvanized iron is not galvanized—simply coated with zinc.

German silver is not silver at all, but an alloy in use in China time out of mind.

Gothic architecture is not that of the Goths.

Kid gloves are not kid, but are made of lambskin or sheepskin.

Pompey's Pillar, in Alexandria, was erected neither by nor to Pompey.

Prussian blue does not come from Prussia—it is the precipitate of the salt of protoxide of iron with red prussiate of potash.

Rice paper is not made from rice, but from the pith of tungtsau or hollow-plant.

Sealing-wax is not wax at all, but is made of shellac, Venice turpentine and cinnabar.

Turkeys do not come from Turkey, but North America.

Turkish baths are not of Turkish origin.

Whalebone is not bone, but a substance attached to the upper jaw of the whale, serving to strain the water the creature takes in.

Wormwood has nothing to do with worms or wood, but is the Anglo-Saxon ''wer-mod,'' man-inspiriting, being a strong tonic.

WHY THE BIRTH OF EVERY CHILD SHOULD BE REGISTERED

1. To establish identity.
2. To prove nationality.
3. To prove legitimacy.
4. To show when the child has the right to enter school.
5. To show when the child has the right to seek employment under the child-labor law.
6. To establish the right of inheritance to property.
7. To establish liability to military duty as well as exemption therefrom.
8. To establish the right to vote.
9. To qualify to hold title to and to buy or sell real estate.
10. To establish the right to hold public office.
11. To prove the age at which the marriage contract may be entered into.
12. To make possible statistical studies of health conditions.

1920 CENSUS by STATES & CITIES

WHAT THE 1920 CENSUS TELLS US

NEW YORK CITY has 1,989,216 of foreign-born population.

The center of population of the United States is located in the extreme southwest corner of Owen County, Indiana, 8.3 miles southeast of the town of Spencer. During the decade from 1910 to 1920 it continued to move westward, advancing 9.8 miles in that direction and about one-fifth of a mile north from Bloomington, Ind., where it was located by the census of 1920.

Two States in the Union—Nevada and Delaware—contain only one city or town each of over 5,000 population. But for the divorce evil. there probably would not be a city of 5,000 population in Nevada.

There are in the entire United States only 305 cities of more than 25,000 population; five States boast of but one town of this size; in six other States there are but two; seven others count but three each, and five others but four each.

While, with the exception of Wisconsin, every one of the Middle Western States shows a decrease in the number of farms, California in the ten-year period 1910-1920 showed a gain of 33 per cent, Idaho more than 36 per cent, and Colorado nearly 30 per cent. In Montana the number of farms was doubled, while in Connecticut 4,016 farms were abandoned.

1920 CENSUS BY STATES AND CITIES

(Population over 9,000)

Figures in parentheses after names of States denote rank in population

ALABAMA (18)

2,348,174

Anniston ...	17,734
Bessemer ...	18,674
Birmingham .	178,806
Dotham	10,034
Florence ...	10,529
Gadsden ...	14,737
Mobile	60,777
Montgomery..	43,464
Selma	15,589
Tuscaloosa ..	11,996

ALASKA

54,899

ARIZONA (44)

333,903

Bisbee	9,205
Douglas	9,916
Phoenix ...	29.053
Tucson	20,292

ARKANSAS (25)

1,752,204

Fort Smith .	28,870
Helena	9,112
Hot Springs.	11,605
Jonesboro ..	9,384
Little Rock .	65,142
North Little Rock	14,048
Pine Bluff ..	19,280

CALIFORNIA (8)

3,426,861

Alameda ...	28,806
Alhambra ..	9,096
Bakersfield .	18,638
Berkeley ...	56,036
Chico	9,339
Eureka	12,923
Fresno	45,086
Glendale ...	13,536
Long Beach.	55,593
Los Angeles.	576,673

California—Cont'd

Modesto	9,241
Oakland	216,261
Pasadena ...	45,354
Pomona	13,505
Redlands ...	9,571
Richmond ..	16,843
Riverside ...	19,341
Sacramento..	65,908
San Bernardino	18,721
San Diego ..	74,683
San Francisco	506,676
San Jose ...	39,642
Santa Ana .	15,485
Santa Barbara	19,441
Santa Cruz .	10,917
Santa Monica	15,252
Stockton ...	40,296
Vallejo	21,107
Venice	10,385

COLORADO (33)

939,629

Boulder	11,006
Colorado Springs ..	30,105
Denver	256,491
Greeley	10,958
Pueblo	43,050
Trinidad ...	10,906

CONNECTICUT (29)

1,380,631

Ansonia	17,643
Bridgeport .	143,555
Bristol	20,620
Danbury ...	22,325
Derby	11,238
Hartford ...	138,036
Meriden	34,764
Middletown .	22,129
Milford	10,193
Naugatuck ..	15,051

Connecticut—Cont'd

New Britain	59,316
New Haven	162,537
New London	25,688
Norwalk	27,743
Norwich	29,685
Shelton	9,475
Stamford	40,067
Stonington	10,236
Torrington	22,055
Wallingford	12,010
Waterbury	91,715
Willimantic	12,330
Windham	13,801

DELAWARE (45)

223,003

Wilmington	110,168

DISTRICT OF COLUMBIA

437,571

Georgetown	17,083
Washington	268,298

FLORIDA (32)

968,470

Jacksonville	91,558
Key West	18,749
Miami	29,571
Orlando	9,282
Pensacola	31,035
St. Petersburg	14,237
Tampa	51,608

GEORGIA (12)

2,895,832

Albany	11,555
Americus	9,010
Athens	16,748
Atlanta	200,616
Augusta	52,548
Brunswick	14,413
Columbus	31,125
La Grange	17,038
Macon	52,995
Rome	13,252
Savannah	83,252
Valdosta	10,783
Waycross	18,068

HAWAII

255,912

Hilo	10,431
Honolulu	83,327

IDAHO (41)

431,866

Boise	21,393
Pocatello	15,001

ILLINOIS (3)

6,485,098

Alton	24,682
Aurora	36,397
Belleville	24,823
Berwyn	14,150
Bloomington	28,725
Blue Island	11,424
Cairo	15,203

Illinois—Cont'd

Canton	10,928
Centralia	12,491
Champaign	15,873
Chicago	2,701,705
Chicago H'ts.	19,653
Cicero	44,995
Collinsville	9,753
Danville	33,776
Decatur	43,818
East St. Louis	66,767
Elgin	27,454
Evanston	37,234
Forest Park	10,768
Freeport	19,669
Galesburg	23,834
Granite City	14,757
Harvey	9,216
Herrin	10,986
Jacksonville	15,713
Joliet	38,442
Kankakee	16,753
Kewanee	16,026
La Salle	13,050
Lincoln	11,882
Marion	9,582
Mattoon	13,552
Maywood	12,072
Moline	30,734
Mt. Vernon	9,815
Murphysboro	10,703
Oak Park	39,858
Ottawa	10,816
Pekin	12,086
Peoria	76,121
Quincy	35,978
Rockford	65,651
Rock Island	35,177
Springfield	59,183
Streator	14,799
Urbana	10,244
Waukegan	19,226

INDIANA (11)

2,930,390

Anderson	29,767
Bedford	9,076
Bloomington	11,595
Brazil	9,293
Clinton	10,962
Connersville	9,901
Crawfordsville	10,139
East Chicago	35,967
Elkhart	24,277
Elwood	10,790
Evansville	85,264
Fort Wayne	86,549
Frankfort	11,585
Gary	55,378
Goshen	9,525
Hammond	36,004
Huntington	14,000
Indiana Harbor (See East Chicago)	
Indianapolis	314,194
Jeffersonville	10,098
Kokomo	30,067
Lafayette	22,486
Laporte	15,158

Indiana—Cont'd

Logansport	21,626
Marion	23,747
Michigan City	19,457
Mishawaka	15,195
Muncie	36,524
New Albany	22,992
New Castle	14,458
Peru	12,410
Richmond	26,765
Shelbyville	9,701
South Bend	70,983
Terre Haute	66,083
Vincennes	17,160
Wabash	9,872
Whiting	10,145

IOWA (16)

2,404,021

Boone	12,451
Burlington	24,057
Cedar Rapids	45,566
Clinton	24,151
Co'cil Bluffs	36,162
Davenport	56,727
Des Moines	126,468
Dubuque	39,141
Ft. Dodge	19,347
Ft. Madison	12,066
Iowa City	11,267
Keokuk	14,423
Marshalltown	15,731
Mason City	20,065
Muscatine	16,068
Oskaloosa	9,427
Ottumwa	23,003
Sioux City	71,227
Waterloo	36,230

KANSAS (24)

1,769,257

Arkansas City	11,253
Atchison	12,630
Chanute	10,286
Coffeyville	13,452
Eldorado	10,995
Emporia	11,273
Fort Scott	10,693
Hutchinson	23,298
Independence	11,920
Kansas City	101,177
Lawrence	12,456
Leavenworth	16,912
Newton	9,781
Ottawa	9,018
Parsons	16,028
Pittsburg	18,052
Salina	15,085
Topeka	50,022
Wichita	72,217

KENTUCKY (15)

2,416,630

Ashland	14,729
Bowling Green	9,638
Covington	57,121
Frankfort	9,805
Henderson	12,169
Hopkinsville	9,696
Lexington	41,534
Louisville	234,891

Kentucky—Cont'd

Newport	29,317
Owensboro	17,424
Paducah	24,735

LOUISIANA (22)

1,798,509

Alexandria	17,510
Baton Rouge	21,782
Lake Charles	13,088
Monroe	12,675
New Orleans	387,219
Shreveport	43,874

MAINE (35)

768,014

Auburn	16,985
Augusta	14,114
Bangor	25,978
Bath	14,731
Biddeford	18,008
Lewiston	31,791
Portland	69,272
So. Portland	9,254
Waterville	13,351
Westbrook	9,453

MARYLAND (28)

1,449,661

Annapolis	11,214
Baltimore	733,826
Cumberland	29,837
Frederick	11,066
Hagerstown	28,064

MASSACHUSETTS (6)

3,852,356

Adams	12,967
Amesbury	10,036
Arlington	18,665
Athol	9,792
Attleboro	19,731
Belmont	10,749
Beverly	22,561
Boston	748,060
Braintree	10,580
Brockton	66,254
Brookline	37,748
Cambridge	109,694
Chelsea	43,184
Chicopee	36,214
Clinton	12,979
Danvers	11,108
Dedham	10,792
E. Hampton	11,261
Everett	40,120
Fall River	120,485
Fitchburg	41,029
Framingham	17,033
Gardner	16,971
Gloucester	22,947
Greenfield	15,462
Haverhill	53,884
Holyoke	60,203
Lawrence	94,270
Leominster	19,744
Lowell	112,759
Lynn	99,148
Malden	49,103
Marlboro	15,028

Massachusetts—Cont'd

Medford	39,088
Melrose	18,204
Methuen	15,189
Milford	18,471
Milton	9,382
Natick	10,907
New Bedford	121,217
Newburyport	15,618
Newton	46,054
North Adams	22,282
Northampton	21,951
North Attleboro	9,238
Northbridge	10,174
Norwood	12,627
Palmer	9,896
Peabody	19,552
Pittsfield	41,763
Plymouth	13,045
Quincy	47,876
Revere	28,823
Salem	42,529
Saugus	10,874
Somerville	93,091
Southbridge	14,245
Springfield	129,614
Taunton	37,137
Wakefield	13,025
Waltham	30,915
Watertown	21,457
Webster	13,258
Westfield	18,604
West Springfield	13,443
Weymouth	15,057
Winchester	10,485
Winthrop	15,455
Woburn	16,574
Worcester	179,754

MICHIGAN (7)

3,668,412

Adrian	11,878
Alpena	11,101
Ann Arbor	19,516
Battle Creek	36,164
Bay City	47,554
Benton H'bor	12,233
Cadillac	9,750
Detroit	993,678
Escanaba	13,103
Flint	91,599
Grand Rapids	137,634
Hamtramck	48,615
Highland Pk.	46,499
Holland	12,183
Ironwood	15,739
Ishpeming	10,500
Jackson	48,374
Kalamazoo	48,487
Lansing	57,327
Manistee	9,694
Marquette	12,718
Monroe	11,573
Mt. Clemens	9,488
Muskegon	36,570
Muskegon Hts.	9,514
Owosso	12,575
Pontiac	34.273
Port Huron	25,944

Michigan—Cont'd

River Rouge	9,822
Saginaw	61,903
Sault Ste. Marie	12,096
Traverse City	10,925
Wyandotte	13,851

MINNESOTA (17)

2,387,125

Austin	10,118
Brainerd	9,591
Chisholm	9,039
Duluth	98,917
Faribault	11,089
Hibbing	15,089
Mankato	12,469
Minneapolis	380,582
Rochester	13,722
St. Cloud	15,873
St. Paul	234,680
Virginia	14,022
Winona	19,143

MISSISSIPPI (23)

1,790,618

Biloxi	10,937
Columbus	10,501
Greenville	11,560
Hattiesburg	13,270
Jackson	22,817
Laurel	13,037
Meridian	23,399
Natchez	12,608
Vicksburg	18,072

MISSOURI (9)

3,404,055

Cape Girardeau	10,252
Carthage	10,068
Columbia	10,392
Hannibal	19,306
Independence	11,686
Jefferson City	14,490
Joplin	29,902
Kansas City	324,410
Moberly	12,808
St. Joseph	77,939
St. Louis	772,897
Sedalia	21,144
Springfield	39,631
Webster Groves	9.474

MONTANA (38)

548,889

Anaconda	11,668
Billings	15,100
Butte	41,611
Great Falls	24,121
Helena	12,037
Missoula	12,668

NEBRASKA (31)

1,296,372

Beatrice	9,664
Fremont	9,605
Grand Island	13,947
Hastings	11,647
Lincoln	54,948
North Platte	10,466
Omaha	191,601

NEVADA (47)

77,407

Reno	12,016

NEW HAMPSHIRE (40)

443,083

Berlin	16,104
Claremont	9,524
Concord	22,167
Dover	13,029
Keene	11,210
Laconia	10,897
Manchester	78,384
Nashua	28,379
Portsmouth	13,569
Rochester	9,673

NEW JERSEY (10)

3,155,900

Asbury Park	12,400
Atlantic City	50,707
Bayonne	76,754
Belleville	15,660
Bloomfield	22,019
Bridgeton	14,323
Burlington	9,049
Camden	116,309
Clifton	26,470
Dover	9,803
East Orange	50,710
Elizabeth	95,783
Englewood	11,627
Garfield	19,381
Gloucester	12,162
Hackensack	17,667
Harrison	15,721
Hoboken	68,166
Irvington	25,480
Jersey City	298,103
Kearny	26,724
Long Branch	13,521
Millville	14,691
Montclair	28,810
Morristown	12,548
Newark	414,524
New Brunswick	32,779
Nutley	9,421
Orange	33,268
Passaic	63,841
Paterson	135,875
Perth Amboy	41,707
Phillipsburg	16,923
Plainfield	27,700
Rahway	11,042
Red Bank	9,251
Roosevelt	11,047
Rutherford	9,497
Summit	10,174
Trenton	119,289
Union	20,651
Westfield	9,063
West Hoboken	40,074
West New York	29,926
West Orange	15,573

NEW MEXICO (42)

360,350

Albuquerque	15,157

NEW YORK (1)

10,384,829

Albany	113,344
Amsterdam	33,524
Auburn	36,192
Batavia	13,541
Beacon	10,996
Binghamton	66,800
Buffalo	506,775
Cohoes	22,987
Corning	15,820
Cortland	13,294
Dunkirk	19,336
Elmira	45,393
Endicott	9,500
Fulton	13,043
Geneva	14,648
Glens Falls	16,638
Gloversville	22,075
Herkimer	10,453
~~Hornell~~	15,025
Hudson	11,745
Ilion	10,169
Ithaca	17,004
Jamestown	38,917
Johnstown	10,908
Kingston	26,688
Lackawanna	17,918
Little Falls	13,029
Lockport	21,308
Middletown	18,420
Mt. Vernon	42,726
Newburgh	30,366
New Rochelle	36,213
New York	5,620,048
Bronx	732,016
Brooklyn	2,018,356
Manhattan	2,284,103
Queens	469,042
Richmond	116,531
Niagara Falls	50,760
North Tonawanda	15,482
Oneonta	11,582
Ogdensburg	14,609
Olean	20,506
Oneida	10,541
Oneonta	11,582
Ossining	10,739
Oswego	23,626
Peekskill	15,868
Plattsburg	10,909
Port Chester	16,573
Port Jervis	10,171
Poughkeepsie	35,000
Rensselaer	10,823
Rochester	295,750
Rome	26,341
Salamanca	9,276
Saratoga Spgs.	13,181
Schenectady	88,723
Syracuse	171,717
Tonawanda	10,068
Troy	72,013
Utica	94,156
Watertown	31,285
Watervliet	16,073
White Plains	21,031
Yonkers	100,176

NORTH CAROLINA (14)

2,559,123

Asheville	28,504
Charlotte	46,338
Concord	9,903
Durham	21,719
Gastonia	12,871
Goldsboro	11,296
Greensboro	19,861
High Point	14,302
Kinston	9,771
Newbern	12,198
Raleigh	24,418
Rocky Mount	12,742
Salisbury	13,884
Wilmington	33,372
Wilson	10,612
Winston Salem	48,395

NORTH DAKOTA (35)

645,680

Fargo	21,961
Grand Forks	14,010
Minot	10,476

OHIO (4)

5,759,394

Akron	208,435
Alliance	21,603
Ashland	9,249
Ashtabula	22,082
Barberton	18,811
Bellaire	15,061
Bellefontaine	9,336
Bucyrus	10,425
Cambridge	13,104
Canton	87,091
Chillicothe	15,831
Cincinnati	401,247
Cleveland	796,841
Cleveland Hts.	15,236
Columbus	237,031
Conneaut	9,343
Coshocton	10,847
Cuyahoga Falls	10,200
Dayton	152,559
E. Cleveland	27,292
E. Liverpool	21,411
E. Youngstown	11,237
Elyria	20,474
Findlay	17,021
Fostoria	9,987
Fremont	12,468
Hamilton	39,675
Ironton	14,007
Kenmore	12,683
Lakewood	41,732
Lancaster	14,706
Lima	41,306
Lorain	37,295
Mansfield	27,824
Marietta	15,140
Marion	27,891
Martins Ferry	11,634
Massillon	17,428
Middletown	23,594
Mt. Vernon	9,237

Ohio—Cont'd

Newark	26,718
New Philadelphia	10,718
Niles	13,080
Norwood	24,966
Piqua	15,044
Portsmouth	33,011
Salem	10,305
Sandusky	22,897
Springfield	60,840
Steubenville	28,508
Tiffin	14,375
Toledo	243,164
Warren	27,050
Xenia	9,110
Youngstown	132,358
Zanesville	29,569

OKLAHOMA (21)

2,028,283

Ardmore	14,181
Bartlesville	14,417
Chickasha	10,179
Enid	16,576
Guthrie	11,757
McAlester	12,095
Muskogee	30,277
Okla. City	91,295
Okmulgee	17,430
Picher	9,676
Sapulpa	11,634
Shawnee	15,348
Tulsa	72,075

OREGON (34)

783,389

Astoria	14,027
Eugene	10,593
Portland	258,288
Salem	17,679

PENNSYLVANIA (2)

8,720,017

Allentown	73,502
Altoona	60,331
Ambridge	12,730
Beaver Falls	12,802
Berwick	12,181
Bethlehem	50,358
Braddock	20,879
Bradford	15,525
Bristol	10,273
Butler	23,778
Canonsburg	10,632
Carbondale	18,640
Carlisle	10,916
Carnegie	11,516
Carrick	10,504
Chambersburg	13,171
Charleroi	11,516
Chester	58,030
Coatesville	14,515
Columbia	10,836
Connellsville	13,804
Dickson City	11,049
Donora	14,131
Dubois	13,681
Dunmore	20,250
Duquesne	19.011
Easton	33,813
Edwardsville	9,027
Erie	93,372

Pennsylvania—Cont'd

Farrell	15,586
Franklin	9,970
Greensburg	15,033
Harrisburg	75,917
Hazleton	32,277
Homestead	20,452
Jeanette	10,627
Johnstown	67,327
Lancaster	53,150
Lansford	9,625
Larksville	9,438
Latrobe	9,484
Lebanon	24,643
Lewistown	9,849
Mahaney City	15,599
McKeesport	46,781
McKees Rocks	16,713
Meadville	14,568
Monessen	18,178
Mt. Carmel	17,469
Nanticoke	22,614
New Brighton	9,361
New Castle	44,938
New Kensington	11,987
Norristown	32,319
Northampton	9,349
North Braddock	14,928
Oil City	21,274
Old Forge	12,237
Olyphant	10,236
Philadelphia	1,823,779
Phoenixville	10,484
Pittsburgh	588,103
Pittston	18,497
Plymouth	16,500
Pottstown	17,431
Pottsville	21,876
Punxsutawney	10,311
Reading	107,784
Salem	17,679
Scranton	137,783
Shamokin	21,204
Sharon	21,747
Shenandoah	24,726
Steelton	13,428
Sunbury	15,721
Swissvale	10,908
Tamaqua	12,363
Taylor	9,876
Tyrone	9,084
Uniontown	15,692
Vandergrift	9,531
Warren	14,272
Washington	21,480
Waynesboro	9,720
West Chester	11,717
Wilkes-Barre	73,833
Wilkinsburg	24,403
Williamsport	36,198
Windber	9,462
Woodlawn	12,495
York	47,512

THE PHILIPPINES

10,350,640

Aparri	18,252
Argao	35,448

Philippines—Cont'd

Barili	31,617
Batac	19,524
Batangas	33,131
Bauan	39,094
Baybay	22,990
Burauen	18,197
Camiling	25,243
Candon	18,828
Capiz	18,525
Carcar	31,895
Cebu	31,079
Dagupan	20,357
Dalaguete	21,354
Daraga	18,695
Dumanhug	22,203
Guinobatan	20,027
Hagonoy	21,304
Iloilo	19,054
Iriga	19,297
Janiuay	20,738
Laoag	34.454
Lipa	37,934
Loon	18,114
Lubao	19,063
Manila	219,928
Miagao	20,656
Nabua	18,893
Narvacan	19,575
Pototan	20,964
San Carlos	27,166
San Nicolas	29,055
San Pablo	22,612
Sibonga	25,848
Tabaco	21,946
Toledo	19,929
Tondo	39,043
Tuburan	19,158
Urdaneta	20,544

PORTO RICO

1,297,772

Arecibo	10,039
Bayamon	10,411
Caguas	12,154
Mayaguez	19.069
Ponce	41,561
San Juan	70,707

RHODE ISLAND (37)

604,397

Bristol	11,375
Central Falls	24,174
Cranston	29,407
Cumberland	10,077
East Providence	21,793
Lincoln	9,543
Newport	30,255
Pawtucket	64,248
Providence	237,595
Warwick	13,481
Westerly	9,952
West Warwick	15,461
Woonsocket	43,496

SOUTH CAROLINA (26)

1,683,724

Anderson	10,570
Charleston	67,957